

COMPUTERWORLD

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The next Big One could leave West Coast data centers in shambles, as few are prepared for predicted earthquakes. Page 75.

Vendors in benchmark test frenzy

BY STANLEY GIBSON
and NELL MARGOLIS
CW STAFF

Is it the technological equivalent of the Olympics, or is it merely Wrestlemania?

Whatever the arena, Digital Equipment Corp. and Oracle Corp. jumped in with both feet last week, challenging their market opponents with sets of

On your marks . . .

- March 16, 1987: Tandem sets Debit/Credit standard with 208 transaction/sec.
- April 19, 1988: IBM announces advance for DB2 under new operating system, hits 186.
- May 4: Relational Technology tries to boost Ingres by claiming 104 on series of Sequent processors.
- July 18: Oracle claims figure that bests Tandem and DB2: 265.
- July 19: DEC notches over 100 with DEC TP.

benchmark results. The two became the latest in a lengthening list of computer hardware and data base vendors attempting to use benchmark figures to boost their products' image.

DEC published Debit/Credit benchmark results that showed it performing three times as well as IBM and twice as well as Tandem Computers, Inc. (see story page 6).

One day earlier, Oracle Corp. claimed to break the "world record for performance" by running at 265 Debit/Credit transaction/sec., beating the previous record of 241 transaction/sec. held by Tandem (see story page 109).

Reactions from observers
Continued on page 109

Unix foes lighting peace pipe?

AT&T retracts opposition to OSF membership; truce seen imminent

BY ROSEMARY HAMILTON
and MITCH BETTS
CW STAFF

Evidence mounted last week that the rival Unix camps of AT&T and the Open Software Foundation are making an intense effort to settle their differences and possibly join forces.

"Assuming there are no significant roadblocks, there's nothing that says we wouldn't join" the OSF, said Larry Dooling, vice-president of marketing and sales support at AT&T.

Dooling's comment was the strongest indication yet of an upcoming effort to form a union between the two factions. When the OSF was launched a little more than two months ago, AT&T stated, "We are not joining this group," and called the OSF "a new group with no track record."

That was then, this is now
"That statement was absolutely accurate then," Dooling said. "At that time, it was unclear in our minds what their approach would be. It didn't mean we wouldn't join in the future."

A truce between AT&T and the OSF could end the recent tumult in the Unix market. The market currently has two stan-

dards efforts under way: Unix System V from Unix originator AT&T and the bold plans provided by the rival OSF, which was founded by industry heavyweights IBM, Digital Equipment Corp., Hewlett-Packard Co. and others.

Both the OSF and AT&T confirmed last week that several talks have been held to resolve disputes between the camps.

"I'd say discussions between the two are ongoing with reasonably synonymous goals," Dool-

ing said.

Sun Microsystems, Inc., whose agreement with AT&T contributed to the Unix market split, would not comment on AT&T's plan. However, Sun has also recently sent signals that it is considering OSF membership.

Other events last week further indicated that the wall erected between the OSF and AT&T will come down.

• Both organizations withdrew from a public forum held last
Continued on page 6

Upgraded DOS gets a facial

BY DOUGLAS BARNEY
CW STAFF

Throw away those expensive DOS training tapes. Forget about that nasty A>. Just buy the latest version of DOS and those days will be long gone.

At least that is the hope of both IBM and Microsoft Corp., which last week announced the first major revamp of DOS since the introduction of DOS 3.1 more than three years ago.

Call it PC-DOS 4.0, as IBM does, or Microsoft MS-DOS 4.0. Either describes the same operating system, which overcomes

many of the nagging shortcomings of the most popular personal computer operating system in the world.

The biggest improvement is the end of arcane commands needed to complete such simple tasks as copying or deleting files. Instead of Copy A:*.* B:, gobbledygook for copying disk A to disk B, users simply invoke a menu.

This approach applies to many DOS commands that users have to continually look up or, worse, bother busy MIS professionals seeking the answers to other such annoying and muni-

Continued on page 4

IMPERFECT UNION

No banking boom for IBM-Hogan

BY ROSEMARY HAMILTON
CW STAFF

When IBM teamed up with Hogan Systems, Inc. in 1986, critics in the software industry cried foul.

They feared the pair would become the dominant force in the banking software market. They called the Hogan deal the start of an IBM strategy to take over selected segments of the software industry.

One industry figure went so far as to call on IBM to "cease and desist" in its takeover of the independent software industry.

Two years later, these fears

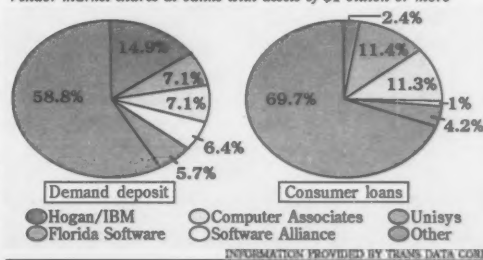
appear to have been greatly exaggerated. What was supposed to be a killer combination appears, for now, to be a disappointment. The alliance has

faced a series of struggles, including the following:

- A very slow start that has left Hogan scrambling to explain
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Hogan's tenuous grasp

Vendor market shares at banks with assets of \$1 billion or more



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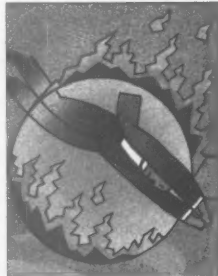
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"Assuming there are no significant roadblocks, there's nothing that says we wouldn't join."

LARRY DOOLING
AT&T

On talks between AT&T and the Open Software Foundation. See story page 1.

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NEWS

Dog day bites flights

San Francisco air traffic halted as radar roasts

BY KATHY CHIN LEONG
CW STAFF

OAKLAND, Calif. — Record-setting temperatures that hit the San Francisco area a week ago overheated the area's computer and radar-related air traffic control systems last Sunday, halting all air traffic for nearly two hours.

The mishap affected 10 airports, delayed outgoing flights and caused incoming flights to be rerouted until the systems were restored.

According to Charles Henderson, an automation specialist at the Federal Aviation Administration, the three Unisys Corp. Univac 8300 processors and the sophisticated radar-associated gear used at the Oakland Airport radar control facility went down when the scorching heat pushed room thermometers up past 100 degrees. The radar control room was using air-conditioning units,

but they were not enough to compensate for the extreme temperatures.

Forty-six departing flights and 25 incoming flights were delayed that day for more than 90 minutes, Henderson said.

The Univac computer provides "supplemental information" to radar terminals that help air traffic personnel identify the planes that come into and depart from the Bay Area, Henderson said. Although the radar worked, the terminals were completely inactive, he said. A systems board in the radar-related system known as "common equipment" was damaged during the heat wave, he added.

"This event did not put any one in danger," control center spokeswoman Barbara Abels said. The problem was soon remedied after fans were brought in to cool the equipment and malfunctioning equipment was replaced.

Umbrellas go up on Wall Street

BY JAMES DALY
CW STAFF

Storm clouds were boiling over Wall Street technology issues last week after a series of disappointing earnings reports initiated sharp stock sell-offs. But analysts were not advising investors to build an ark just yet.

As the week wore on and high hopes met cold reality, many panicky investors headed for the tall grass. Fault-tolerant systems maker Tandem Computers, Inc.'s stock took a pounding after news of lower-than-anticipated earnings was released late in the week. A similar nosedive struck Silicon Graphics, Inc., the Mountain View, Calif., workstation maker, whose stock tumbled more than 30% for the week after an earnings report fell short of expectations.

Similar unpleasant surprises were sprung by Data General Corp. and Seagate Technology, both of which suffered sharp stock drops after posting lower-than-expected earnings.

But analysts advised against panicking just yet. "We're seeing a shift in the structure of demand, and that's causing some dislocation, but the industry remains healthy," said Marc Schulman, director of the technology research group at Salomon Brothers, Inc. "Demand for low-

end systems like personal computers and local-area networks is exploding, while the demand for mid-range systems has weakened."

The problems that struck technology stocks were further exacerbated by heavy purchasing last spring by investors who anticipated strong second-quarter gains. "So the half-dozen companies who gave us negative surprises were punished severely," said David Wu, an analyst with S. G. Warburg & Co.

THIS DECLINE has got zero to do with the big picture."

LOUIS GIGLIO
BEAR, STEARNS & CO.

Ripples from the sell-offs also had broad implications for the industry as a whole. In the over-the-counter market — where high-technology companies are most actively traded — the composite index fell to 388.86, its lowest level since June 20. The Dow Jones industrial average was also unflinching.

But analysts said it is too early to draw broad conclusions about the industry's health. "This decline has got zero to do with the big picture," said Louis Giglio, an analyst with Bear, Sterns & Co. "You can't toss companies like IBM, DEC, Tandem, Apple and Novell into the same vat, stir it around and say the computer industry is healthy or unhealthy. The dynamics of the industry won't allow it."



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RYE BROOK, N.Y. — IBM added three models to its slow selling RT computer family and cast off three others last week. But industry analysts said that while IBM's commitment to the technical workstation marketplace is obvious, it still lacks a very strong entry.

To effectively compete in the reduced instruction set computing (RISC) market, IBM needs a high-end product that will top those introduced last week, said Wendy Abramowitz, a senior analyst at Argus Research Corp. All analysts contacted agreed that the RT will not account for more than a minuscule portion of IBM's revenue in the near future. But more important than IBM's bottom line, they said, is the company's strong show of support for its version of the Unix operating system, AIX.

During the announcement, IBM said it has stepped up its efforts to recruit independent software developers to write pro-

grams for its AIX operating systems, including AIX/RT for RT systems, AIX PS/2 for the Personal System/2s and AIX/370 for large systems. In addition, IBM announced AIX/RT vs Cobol for commercial customers in multiuser Unix environments and enhancements that make use of Relational Technology, Inc.'s Ingres and Oracle Corp.'s Oracle data base management systems.

Shao Wang, an analyst at Smith Barney, Harris Upham & Co., said the commitment to AIX is something "IBM clearly has not had as a previous strength."

Building on that AIX strength, IBM will likely introduce even more powerful and flexible RTs next year, analysts said. It is expected that IBM may quadruple the performance of the RTs each year. Because of those high expectations, some were disappointed with the latest announcements.

Stephen Dube, a senior vice-president at Shearson Lehman

Hutton, Inc. in New York, said he was expecting to see RTs that incorporated IBM's proprietary Micro Channel architecture. "They may be awaiting the next round of RTs where they are supposed to come out with a new processor. The goal is to get the Micro Channel on that machine," he said.

The breadth of the RT line will probably have little impact on IBM's PS/2 and 9370 families, analysts said, because each series is targeting different users.

The new RTs — called systems now rather than RT Personal Computers — include two floor-standing units, the Models 135 and B35, and one desktop unit, the Model 130. All three models come standard with 16M bytes of CMOS memory, four times the amount of standard memory previously offered in the workstations. In addition, the RISC-based units offer up to 25% faster processing and improved floating-point processing than did the older models, according to IBM.

The Model 130 is priced at \$23,220, the Model 135 costs \$30,595 and the Model B35 costs \$32,165.

IBM spokesman Doug DeLay said IBM has withdrawn the older RT Models 10 and 20 as well as the A-25. He added that no price cuts have been announced for the existing older models of the RT line.

For the RT line, IBM announced a 310M-byte disk storage device. The larger RT models can include up to three of the storage units, for a total of 930M bytes of storage, IBM said.

Users said IBM's latest moves make the RTs more attractive. "The RTs now are substantially better machines than when they came out," said Alfred Spector, director of the information center at Carnegie-Mellon University in Pittsburgh. He cited improvement of the units' disk access speed, improved processor speed and an improved compiler.

Giving the RT another vote of confidence are developers at Northwestern National Life Insurance Co. in Minneapolis, which markets a mainframe software product called PMIS that handles management functions for in-plant scheduling. The company said it plans to announce an IBM RT version of the package sometime next month.

dane questions.

"This will make our training a lot easier," said Ray Barron, information center manager at Michigan Consolidated Gas Co. in Detroit.

Of course, the added benefits come at an added cost. DOS 4.0 costs \$150, \$30 more than the cost of IBM's PC-DOS 3.3, which will continue to remain on the market.

According to one of IBM's PC-DOS development managers, the shell of the operating system was designed to be similar to that of the upcoming OS/2 Presentation Manager. The DOS complies with the user interface component of IBM's Systems Application Architecture.

But unlike the Presentation Manager, DOS 4.0 does not require high-resolution graphics, according to IBM's Shon Saliga, development manager for the PC-DOS project, which involved up to 150 people and took 2½ years to complete.

In fact, DOS 4.0 works within a number of graphics modes. For older style monochrome monitors, the product works in text mode but still provides many easy-to-use features. On newer, higher resolution displays, the product makes full use of icons and scroll bars.

However, some of the esoteric DOS functions, used by only the hardiest of PC jocks, still require the old-style command-line

interface. These commands include programmer-oriented functions such as the keyboard utilities for changing keyboard character sets.

In addition to the interface, DOS 4.0 sports a number of added functions. Foremost among them is the breaking of the 32M-byte limitation on the size of single volumes on a hard disk drive.

This achievement was good news for Warren Camp. "We're definitely running into disk limitations. Some of our data sets are very large because we do a lot of real-time monitoring," said Camp, supervisor of information

ternative to OS/2 for users who simply require more space for large spreadsheets and data bases.

DOS 4.0 requires a great deal more memory — 360K bytes of RAM — to use the shell, but that shell is not active when applications are running. When that happens, DOS 4.0 requires only 8K bytes more than previous versions.

According to Microsoft, the product demonstrates that DOS is not dead, despite all the attention the firm is paying to OS/2. And although Microsoft will make no new programmatic in-



services at Tenneco Oil Processing & Marketing in Chalmette, La. Support for the Lotus/Intel/Microsoft Expanded Memory Specification (EMS) 4.0 has also been built in to the system.

EMS 4.0 allows for data sets of up to 32M bytes of random-access memory and is an ideal al-

interfaces for DOS, it does plan to release another upgrade to the system in about one year, according to Russ Werner, manager of DOS and Windows at Microsoft.

West Coast correspondent Stephen Jones contributed to this report.

NEW YORK — A routine audit at Metro-North Commuter Railroad here resulted in the dismissal last week of the railroad's top MIS executive and forced the resignation of seven senior data processing employees.

The audit revealed that MIS department employees allegedly charged the railroad for lunches and travel expenses that were not related to business, a Metro-North spokeswoman said.

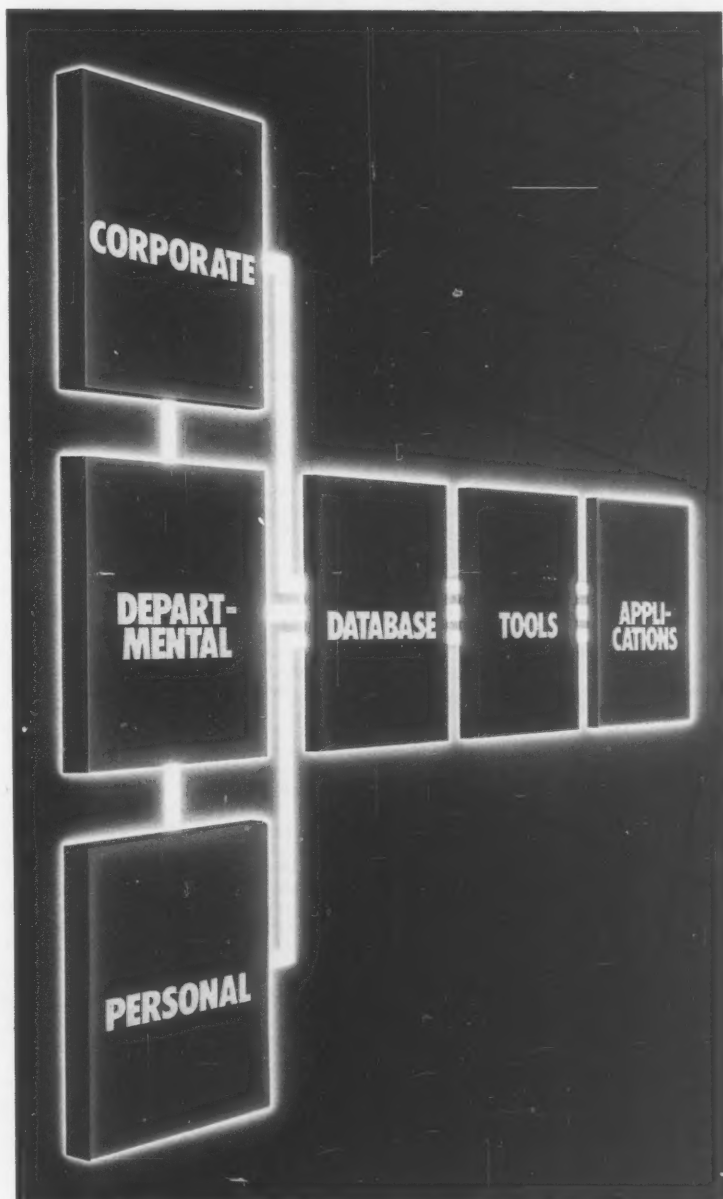
The alleged improprieties, which did not involve computer use, are said to have cost the railroad in excess of \$10,000 during the last 18 months. The Metro-North spokeswoman declined to confirm that figure, however.

The matter is being investigated by the Inspector General of the Metropolitan Transit Authority, the railroad's parent agency. The investigation is expected to yield indictments.

In the wake of the investigation, Metro-North fired MIS director Anthony Pellicione. Seven other MIS employees, including two assistant directors, resigned. In addition, two other MIS employees have been suspended with pay, the Metro-North spokeswoman said. Metro-North's assistant controller, William Nelson, is heading MIS on a temporary basis.

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DEC leaps into hot race with on-line products

BY STANLEY GIBSON
CW STAFF

NEW YORK — Digital Equipment Corp. shielded an Achilles' heel last week and simultaneously hopped into a hot market by announcing a suite of on-line transaction processing products called DEC TP.

In all, DEC unveiled 12 products — 11 of them software — led by a transaction processing monitor, a disk drive array and a version of its RDB relational data base management system.

DEC revealed a distributed transaction architecture, separating the process into a front end and back end, both of which

are VAX systems. The software components can work together in various combinations to boost on-line transaction processor performance far above previous DEC standards.

Prior to the announcement, DEC said, the highest typical transaction throughput for its systems was 50 transaction/sec. Now, DEC can perform 50 transaction/sec. typically, with a maximum of more than 100 transaction/sec.

"Unequivocally, DEC has gotten into the race," said Dale Kutnick, an independent consultant in Redding, Conn. Having often been criticized for lackluster transaction processing per-

formance, DEC can now make progress in a lucrative, growing market, he explained.

To support its performance claims, DEC released benchmark results of its transaction processing configurations performing the Debit/Credit benchmark. DEC also released performance results and estimates of IBM and Tandem Computers, Inc. systems under the Debit/Credit benchmark.

Kutnick said DEC's unfamiliarity with the transaction processing market would make progress slow.

The announcement parade was led by the widely anticipated Decintact, a transaction monitor for high-volume processing. Decintact is intended for flat files as opposed to relational files.

DEC claimed greatly increased performance from VAX RDB/VMS Version 3 relational DBMS. It incorporates Version 2 of VAX SQL software, which also debuted.

In an announcement that had

been anticipated for some two years, DEC rolled out the SA600 Storage Array, incorporating RA90 disk drives. The new disks offer 2G bytes of storage each,

using thin-film heads and media. The SA600 Storage Arrays come in four- or eight-disk configurations, offering up to 9.7G bytes of capacity.

The finishing touches

Digital Equipment Corp. rolled out a suite of software offerings to round out its on-line transaction processing scheme, including the following:

- VAX Rally Version 2, a fourth-generation language tool that helps programmers develop data base applications.
- VAX CDD/Plus Common Data Dictionary Version 4 software, a dictionary and repository system for a distributed data base.
- VAX DBMS Version 4 software, a data base management system designed to handle high-transaction volumes.
- VAX Data Distributor Version 2, which manages the distribution of relational data bases automatically among multiple processors.
- VAX ACMS Version 3, a fourth-generation language transaction processing monitor.
- Vaxlink software, which provides a bridge for DEC's VAX RDB/VMS data bases and IMS and VSAM structures on IBM systems, so data from IBM mainframes can be copied into VAX RDB/VMS data bases.

DEC's racing team

Sample configurations of DEC's transaction processing systems

Starter system: Microvax 3500	Relational data base system: VAX 6220	High-performance system: VAX 8842
Memory		
• 32M bytes • 8M-byte memory board	• 64M bytes • 32M-byte memory board	• 256M bytes
Storage		
• 0.5G-byte disk • RA70 (280M bytes) • 5 1/4-in. disk	• 5G-byte disk • KDB50 disk controller • RA 82 disk	• 34.1G-byte disk • Start-up and support package • HSC70 controller • Disk channel (four disks) • SA600 • Storage array (9.7G bytes)
Software		
• Decintact • Cobol • Vaxset	• VAX Common Data Dictionary • VAX RDB • VAX Terminal Data Management System • VAX ACMS • Cobol • Vaxset	• Decintact • Cobol • Vaxset
Approximate cost		
• \$245,000	• \$698,000	• \$3.3 million

INFORMATION PROVIDED BY DIGITAL EQUIPMENT CORP.

IBM shuffles management

BY CLINTON WILDER
CW STAFF

PURCHASE, N.Y. — IBM reshuffled its management deck again last week as it continued its recent series of rapid-fire moves to reduce overhead and move more representatives into the field.

IBM melded its two U.S. marketing organizations into one that will be led by fast-track executive George H. Conrades. Conrades, often mentioned by IBM observers as a potential top executive, had been general manager of IBM's Personal Systems line of business for only six months since IBM's major U.S. reorganization in January.

In addition, former group executive of U.S. Marketing & Services Edward E. Lucente was named to implement the

4,000-employee work force reduction announced by IBM late last month [CW, July 4].

Conrades was named to the new position of general manager of U.S. Marketing & Services, reporting to Terry R. Lautenbach, general manager of IBM United States, leaving the top microcomputer executive slot open.



George Conrades

"Lautenbach's man isn't ready yet, and that would suggest that Lowe wouldn't get it," said Bob Djurdjevic, president of Phoenix-based Annex Research, referring to Entry Systems Division head William Lowe.

Djurdjevic specu-

lated that a possible candidate for the job is directeur general of IBM Europe C. Michael Armstrong, who formerly worked in the Entry Systems Division.



Edward Lucente

The new unit overseen by Conrades will combine the U.S. North-Central Marketing Division and the South-West Marketing Division, which were created in 1986.

The move is consistent with IBM's recent push to reduce administrative staffs and deploy more personnel out in the field.

IBM's selling, general and administrative expenses have jumped 40% since 1985 while revenue has risen only 17%, according to analyst Donald Young at Sanford C. Bernstein & Co.

Lucente appears to be IBM's designated work force redeployment czar. He played a significant role in IBM's major reductions of jobs that occurred in 1986.

Unix foes

FROM PAGE 1

Thursday by the 88Open Consortium, claiming that the event could be viewed as confrontational, which would not be in their best interests.

• The OSF issued its first "Request for Technology" last week, soliciting proposals for graphical user interfaces to be used as part of the OSF's open system environment. AT&T said it intends to submit its Open Look graphical user interface for consideration.

Observers said the real force

behind the peace talks is AT&T, which has been left in a no-win situation since the OSF's launch. If it joins the OSF, its control over Unix will be diminished. But if it remains split from the group, it runs the risk of losing its market if the OSF becomes the dominant supplier of Unix.

"AT&T took a gamble," said Judith Hurwitz, editor of "Unix in the Office," a publication of Patricia Seybold's Office Computing Group in Boston. "They tried to be the champion of open systems and use Unix as their own strategic advantage. If you try to do both, you fail."

Neither group would say if

"AT&T TOOK a gamble. They tried to be the champion of open systems and use Unix as their own strategic advantage. If you try to do both, you fail."

JUDITH HURWITZ
"UNIX IN THE OFFICE"

AT&T is about to join the OSF, but observers said they expect this to happen soon. "I think they will join shortly, in a matter of weeks," Hurwitz said.

A. G. W. "Jack" Biddle, president of the Computer & Communications Industry Association in

Washington, D.C., said he is optimistic that a compromise can be reached within six months. "I don't think anybody wants the split to go on," he said.

Biddle said there is a wide-ranging effort within the industry to resolve the problem, in-

cluding AT&T's recent meetings to mollify Unix licensees [CW, July 18].

An OSF spokeswoman said the group is not ready to elaborate on the status of its relationship with AT&T. However, when the group backed out of the 88Open Consortium last week, OSF President Henry Crouse said, "At a time when we are working diligently to resolve our differences, it would be counterproductive to appear in a forum that could be viewed as confrontational."

West Coast Senior Correspondent Julie Pitta contributed to this report.

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NEWS SHORTS

3Com founders resurface

Less than two months after Bridge Communications, Inc. founders Bill Carrico and Judy Estrin quit as officers at parent company 3Com Corp., they have surfaced again as the top executives at a new networking business. Today, Carrico begins work as president and chief executive officer of Network Computer Devices, Inc. and Estrin joins the Palo Alto, Calif., start-up as executive vice-president. The company, founded in February, is the brainchild of three former Ridge Computers employees and is developing computer displays, which communicate over local-area networks, for an August release. The firm may compete with 3Com, according to Mike Harrigan, co-founder and vice-president of marketing.

ADR catches the mini wave

Two years ago when competitors were clamoring to climb on the mid-range platform, Applied Data Research, Inc.'s (ADR) strategy was to stick it out on mainframes and microcomputers. Last week, the firm said it is planning to port at least two of its application development tools to as many as four new platforms, including Unix and Digital Equipment Corp.'s VMS. Bill Clifford, executive vice-president and chief operating officer, said the Ideal fourth-generation language development environment and Depictor, the company's computer-aided software engineering entry, are likely to be moved onto minicomputers. In addition to the DEC VAX, the company is considering working on IBM's Application System/400 and Personal System/2. Not in the works is a move for the Datacom/DB data base management system. "At last count, there were 71 relational or relational-like DBMSs for the VAX," Clifford said. "That's a cutthroat business with very low margins."

Hiring freeze at AT&T

AT&T imposed a companywide hiring freeze last week — and is asking 2,000 AT&T administrative managers to switch over to the company's sales staff. The switch-over is designed to reduce administrative overhead — and to boost lagging sales of computer products. The company also announced that profits were down for the second quarter, while revenue was up. "These are good earnings and match last year's quarter, our best since divestiture," said new AT&T Chairman Robert E. Allen when announcing the results last week. "But we aim to do better than match." Quarterly earnings for the \$33.5 billion communications and computer company were \$594 million, down \$2 million from last year; revenue was \$8.75 billion, compared with \$8.4 billion a year ago.

High-speed super connection

Gould, Inc. and Cray Research, Inc. announced a joint marketing pact last week to sell a high-speed communications processor that will join the two firms' supercomputer systems. The new communications adapter provides a point-to-point connection between the Gould Supercomputer Front-End Processor, a low-end supercomputer, and the Cray-2 and other Cray machines.

International air fares to go on-line

The U.S. Department of Transportation plans to allow airlines to post their international tariffs at sales offices in electronic form rather than paper form so consumers can review the tariffs at computer terminals. The agency said the proposal, announced last week, permits the airline industry to use a more efficient method of meeting the requirement for consumer access to the ever-changing tariffs.

Chip maker hooks up with Bull

G-2, Inc. announced a pact last week to sell a chip set and BIOS software developed by Groupe Bull and reportedly compatible with IBM's Micro Channel architecture. In return, Bull will receive chip design technology, royalties and an assured supply of chip sets manufactured by G-2. The chip set consists of seven chips and will be available during the third quarter, with production quantities available in the fourth quarter, G-2 said.

OS/2 in the chips

Memory prices haven't dampened interest

BY STEPHEN JONES
CW STAFF

Although OS/2 promises to gobble up loads of expensive memory, interest in the fledgling graphics-based version of the system appears unchecked by the personal computer industry's ominous memory-chip shortage.

The fact that most users will not switch to a graphics-based environment for at least another year makes the current paucity of dynamic random-access memory (DRAM) chips little more than a short-term concern, users and analysts said. Indeed, figures released last week by Dataquest, Inc. show possible relief in sight as prices start what could be a downward turn (see story below).

But the DRAM problem raises some serious questions about the difficulty and expense that will be involved in adopting

OS/2 Standard Edition 1.1, which contains the graphics-based Presentation Manager.

Some observers said they believe that a continued trend toward higher memory prices will scare off users considering the costly prospect of plugging OS/2 into hundreds or thousands of PCs in large companies.

That could prove to be a heavy millstone to bear for OS/2 developers IBM and Microsoft Corp. as they try to stir support for the system.

"The rise in DRAM prices could become a real deterrent for users," warned Bill Higgs, director of software research at Infocorp.

Power seekers?

Although Microsoft claims that its Windows sales have not slowed because of the chip shortage, both Windows and OS/2 are greedy when it comes to memory.

Chipping away at DRAM shortage

BY JAMES A. MARTIN
CW STAFF

SAN JOSE, Calif. — After raging on for months, the dynamic random-access memory (DRAM) chip shortage is beginning to ease, according to some analysts and vendors. But they caution that it will be next year before supply is completely available and prices deflated.

According to some reports, 256K-bit DRAM chip contract prices have dropped from 20% to 40% in the last two months, with 1M-bit contract prices falling nearly 20%. Chip prices have begun to decline as more manufacturers bring 1M-bit manufacturing capacities on-line, easing the need for the older-generation 256K-bit chips.

"In general, there has been a

certain easing on the availability," said Albert Wong, cofounder and executive vice-president of advanced technology at AST Research, Inc. in Irvine, Calif. AST was forced to pay spot prices — noncontract prices that do not give the buyer the benefit of long-term contract pricing — on several occasions this year to make ends meet, Wong said.

As a result of higher chip prices, AST, like other vendors, raised its personal computer prices. Recently, however, the company has not had to pay spot prices. "There's been a turning point in pricing now; it's not going up anymore," Wong said. "But it's still high compared to six or seven months ago."

Some said, however, that DRAM prices have not inched

Microsoft said Windows requires up to 3M bytes of memory, while OS/2 needs at least 4M bytes. That can be a lot to swallow when many of today's IBM Personal System/2 models offer only 1M byte of standard memory and memory expansion is running up to \$1,000 per megabyte.

Adrian King, director of operating systems at Microsoft, said chip woes have not changed the company's OS/2 strategy, but he acknowledged that "If a serious shortage continues a year from now, then that's a problem, and I'm really not sure how we'd deal with that."

John McCarthy, a consultant at Forrester Research, Inc., said he expects the chip shortage to subside before OS/2 gains widespread acceptance and memory demands increase.

While mass purchases are not expected for about one year after the Presentation Manager's release in October, McCarthy said memory requirements will always be a critical issue with OS/2.

"If it continues unabated, it would delay arrival of OS/2 on a large scale," McCarthy said.

downward yet and are not expected to for months. Dataquest, Inc. in San Jose released a study last week of the memory chip supply-and-demand headaches and, despite an overall upbeat projection, found that current RAM prices "remain at this elevated level and are not expected to come down until the late third quarter."

"We don't see any drastic movement in DRAM prices until early 1989," said Tim Bajarin, executive vice-president at Creative Strategies Research International, Inc., a consulting firm in Santa Clara, Calif.

A spokesman at Wyse Technology, which raised its PC prices 6% last spring to keep up with chip costs, said prices have not been softening and the supply is still unstable.

Pampel named president in Honeywell Bull shuffle

MINNEAPOLIS — Computer industry veteran Roland Pampel resurfaced last week as president and chief executive officer of Honeywell Bull, Inc., having left Apollo Computer, Inc. the week before.

At Honeywell Bull, Pampel replaces Jerome Meyer, effective today. Meyer will rejoin Honeywell, Inc. in Minneapolis as president of the Industrial Automation and Controls business.

Jacques Stern, chairman of

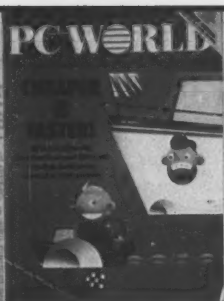
Honeywell Bull and chairman and CEO of its chief owner, France's Groupe Bull, said Meyer's departure was part of the original blueprint of the formation of Honeywell Bull. He acknowledged that the departure plan was not announced publicly, however. But Stern praised Meyer. "He did everything necessary to start a new company," he said, adding that Meyer helped structure the computer operations of Honeywell, Inc. into the new Honeywell Bull,

jointly owned by Groupe Bull, Honeywell and NEC. Honeywell Bull is planning to move its headquarters to the Boston area.

The 53-year-old Pampel's abrupt departure from Apollo as president and chief operating officer took place in the wake of a quarterly loss at the Chelmsford, Mass., workstation maker.

Stern praised Pampel's extensive experience, which began at IBM, where he rose to head Systems Network Architecture development. In 1982, he moved to Prime Computer, Inc. as vice-president of research and development. After a brief stint as an AT&T vice-president, he moved to Apollo two years ago.

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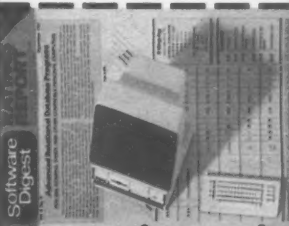
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COMPUTERWORLD

Unisys defense business under fire

'Appalled and dismayed,' Blumenthal calls for procurement reforms

BY MITCH BETTS
CW STAFF

McLEAN, Va. — Unisys Corp. acknowledged last week that its defense systems business is the target of four separate investiga-

tions for alleged procurement fraud and began taking steps to clean up both the division and the company's image.

Unisys Chairman W. Michael Blumenthal, in a publicly released letter to the firm's 90,000

employees, said he is "appalled and dismayed" by the fact that some Unisys defense operations are part of a major procurement scandal that involves consultants who allegedly bribed government officials for inside informa-

tion on procurements.

The chairman stressed that the misconduct was limited to "a few misguided or dishonest persons" at units of the former Sperry Corp. and, for the most part, occurred before the merger of Sperry and Burroughs Corp., which created Unisys in late 1986.

Blumenthal said an internal probe found that certain employ-

ees and consultants working for the Surveillance and Fire Control Division, which is based in Great Neck, N.Y., violated the company's ethics code. He also said Unisys is fully cooperating with the U.S. attorney's investigation.

Measures taken

Last week, Unisys said it had severed its ties with all defense consultants, put six employees on administrative leave and replaced the head of the surveillance division. The division re-

"I AM determined to do everything possible to put this matter behind us so [it] does not hamper the great progress our company has made over the last two years."

W. MICHAEL BLUMENTHAL
UNISYS CORP.

ported \$300 million in revenue in 1987.

The Surveillance and Fire Control Division designs and makes computer-controlled radar systems such as the Aegis shipboard detection and tracking system, a company spokesman said.

Defense contracts account for roughly one-fourth of the company's \$10 billion in annual revenue.

"I am determined to do everything possible to put this matter behind us so that this investigation does not hamper the great progress our company has made over the last two years," Blumenthal said.

Ill winds blow

In addition to the bribery probe, which is called Operation Ill Wind, Unisys confirmed that it is the target of the following three federal investigations into possible overcharges on military contracts:

- A Tucson, Ariz.-based investigation of an \$8 million contract for information systems work at the U.S. Army Communications Center at Fort Huachuca, Ariz. Unisys said any mischarging did not exceed \$250,000 [CW, July 18].
- A Montgomery, Ala.-based investigation of a \$500 million U.S. Air Force contract for administrative computer systems.
- An Albuquerque, N.M.-based inquiry of an Air Force contract for aviation electronics.

Blumenthal said he hopes to "resolve expeditiously" the three contract investigations, which stem from premerger activities of certain Sperry government operations.

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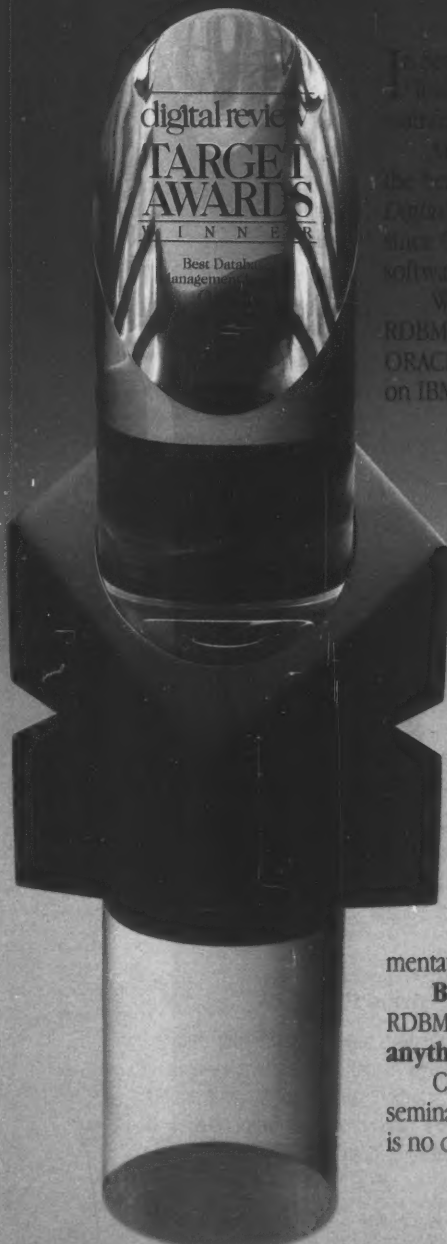
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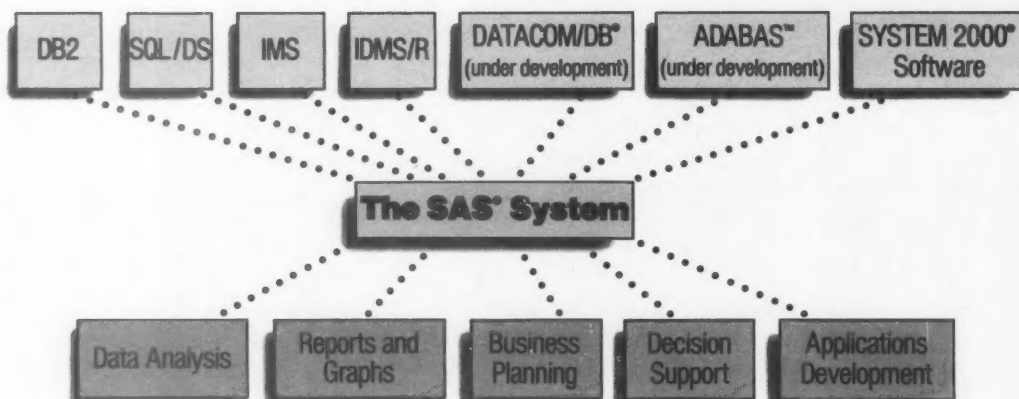
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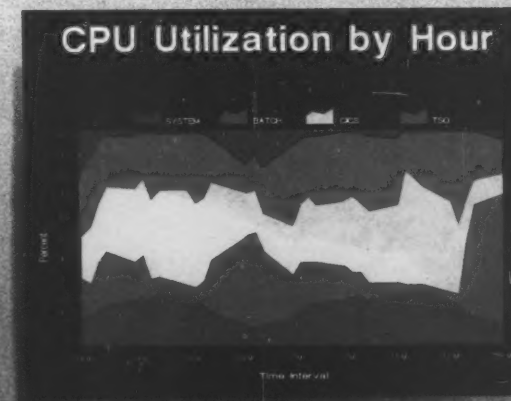
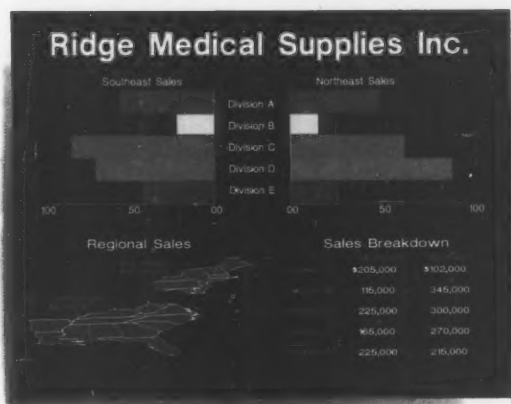
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Hybrid PC plans put on hold

BY JAMES A. MARTIN
CW STAFF

EVERETT, Mass. — Two months after announcing what was said to be the first microcomputer featuring both the IBM Personal Computer AT and Micro Channel buses, Microdirect, Inc. said last week it has put plans to provide Micro Channel architecture compatibility on hold until the fourth quarter of this year or early next year.

Instead, the company will ship a system in volume next month with a proprietary bus that is not Micro Channel architecture compatible.

Meanwhile, Wells American Corp., located in West Columbia, S.C., reportedly will formally unveil this week Compustar, a modular backplane-designed system that can be configured as either a PC AT compatible or IBM Personal System/2 Micro Channel architecture compatible, or both.

Although the two systems use different technology approaches, both are said to appeal to the user who is undecided between the two bus architectures, according to the company.

Apathy to blame

Microdirect blamed the delay in shipping a Micro Channel architecture-compatible PC on lack of interest among potential customers.

The firm showed a prototype of its Microdirect 386 I/O Express, a hybrid AT Micro Channel architecture PC at Comdex/Spring '88 [CW, May 2].

"There will be a PS/2 and OS/2 market, but the promise isn't there yet,"

Unix unaffected by Posix delay

The IEEE Posix standard, expected to be ready last month, has been delayed until October, according to Kevin Lewis, a spokesman at the Institute of Electrical and Electronics Engineers, Inc.

The delay, however, should have little impact on the Unix industry, which has been working with draft versions of the Posix specifications for some time.

"This time lag is kind of moot," said John Williams, chief of the Unix Task Force at General Motors Corp. "We have to wait for the vendors, but they're not just sitting on their thumbs. I understand they are moving ahead with what they have."

According to Lewis, the specification had "some loose ends" when it was voted on last month, although it received a 90% acceptance ballot. "I understand what remains are not big issues," Lewis said. "So if all goes well, it should be approved no later than October."

Posix, a set of specifications to define operating system interface standards, is intended for any operating system. However, it is most closely tied with the Unix community, which intends to use the Posix specifications as the basis for a Unix standard.

"At this point, the difference between the [trial and full-use] drafts is minimal," said Steve Carpenter, a strategy manager at the Open Software Foundation.

claimed Jon H. Hardie, Microdirect's chairman and chief executive officer. "The demand for 286 products has remained stable at a time we expected the 386 to take off, and the 386 is taking off in areas where we thought the PS/2 would be a winner."

Microdirect is still negotiating with IBM regarding patents, but the process is progressing "at a porcupine's pace," Hardie said.

Wells American developed a proprietary cabinet design that uses snap-in modules for its Compustar system, according to product manager Mike Hoyle.

With this design, the systems can be

configured with one of four interchangeable Intel Corp. microprocessors: the 8086, 80286, 80386 and 80386SX.

Wells American will offer users the opportunity to trade in AT modules with a 100% refund toward PS/2 modules, Hoyle added.

In theory, the Compustar would be competitive with Microdirect's 386 I/O Express system, a microcomputer that features three bus architectures: the AT, the Micro Channel architecture and Microdirect's proprietary I/O Express bus.

First of its kind

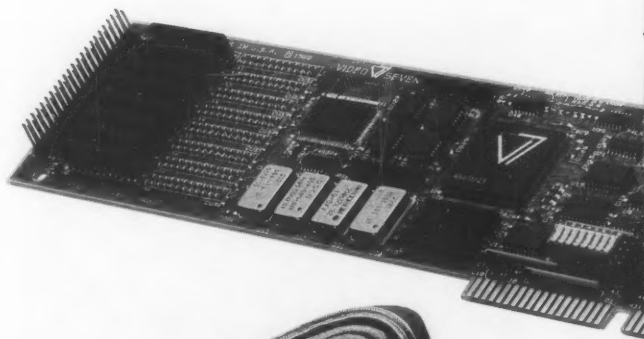
While the backplane-modular design is not unique, Wells American's product will be the first to utilize that approach in the PC market, according to analysts.

"It's a nice concept, an idea that's just now coming to the surface" in the PC market, said Tim Bajarin, executive vice-president at Creative Strategies Research International, Inc., a consulting firm in Santa Clara, Calif. "But we've found that 60% of PC users who buy a 286 system live with what they have."

While faster speeds and more powerful processors are attractive to users, he added, "most are not going to go out and pay extra money for it."

Wells American will release pricing information this week. The systems can be configured for as little as \$995 retail, the company said, for an 8086-based AT compatible and increase to \$35,000 for a fully loaded system, including optical drives and other peripherals.

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VM/CMS founders out

Stripped of autonomy by patron, execs left behind

BY JEAN S. BOZMAN
CW STAFF

BOSTON — When VM/CMS Unlimited, Inc., a \$2 million VM software house, needed capital to stay in business two years ago, it went to San Diego's First Alliance Corp. for financing. Last week, the company went to San Diego permanently, since First Alliance decided unilaterally to move VM/CMS's operations there.

Although most VM/CMS users apparently did not know it, the company be-

came a wholly owned subsidiary of First Alliance two years ago. Last week, VM/CMS founder and President Romney White's business plan unraveled as he and Charles Aronovici, cofounder and executive vice-president, were forced to leave the company.

Although he would not disclose the terms of the 1986 sale, First Alliance "got some pretty good software for not very much money," said White, a former Adesse Corp. executive who founded VM/CMS in 1984.

"I thought they would live up to the understanding that VM/CMS would remain an autonomous unit," he continued. "It's because I think they breached that provision of the agreement that I resigned." Aronovici, who had managed marketing and sales, was fired Wednesday, while two additional Boston office workers resigned.

And then there were six

That leaves six employees in VM/CMS, most of them programmers who enhance and support VM/CMS products by telecommuting from their homes, which are scattered throughout the U.S. and Canada. Large VM/CMS clients include The Prudential Insurance Company of America, Taco Bell Corp. in Irvine, Calif., and

Hewitt Associates in Chicago.

Newly named VM/CMS President Howard Perry described the split with White — who authored the original VM/CMS products — as the result of "a fairly long-standing dispute."

Perry said First Alliance believed White was failing to take on new business opportunities to help the 10-employee company grow. "It was a stubborn little independent subsidiary that didn't look very good to potential backers," Perry said last week.

White said his primary concern is how support will be provided to the 40 IBM mainframe shops that bought the company's Single System Image (SSI) — a product that ties together IBM 4300 and 3090 mainframes — and to 150 more sites that have installed the firm's CMS Command Monitor/Analysis Package.

But SSI's first user, Dr. James Graham of the American Dental Association

"I THOUGHT they would live up to the understanding that VM/CMS would remain an autonomous unit. It's because I think they breached that provision of the agreement that I resigned."

ROMNEY WHITE
VM/CMS UNLIMITED, INC.

(ADA), said he has had so little trouble with SSI that his staff supports the product itself. "We haven't had any problems in a long, long time," Graham said last week from the ADA's Chicago offices. "It just runs by itself after you've tuned it properly."

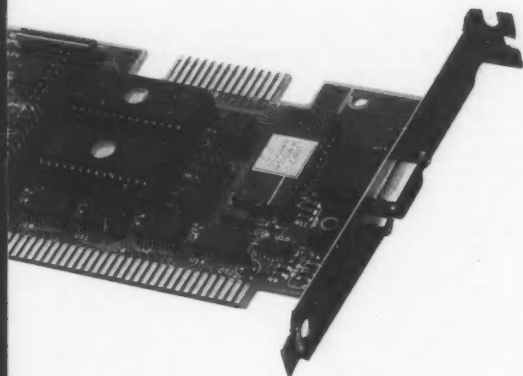
Graham said he had not known of the First Alliance buy-out of VM/CMS or of White's departure. "It all comes as a shock to me," he said. Graham has been running twin IBM 4341s under SSI since 1985.

Perry, hired by First Alliance three months ago, confirmed last week that VM/CMS products will soon be supported from San Diego after VM/CMS's IBM Models 4341 and 4381 have been moved there. First Alliance plans to fold VM/CMS into the new First Alliance Software and Technologies Co.

First Alliance's software and technologies unit was recently spun off from First Alliance Corp., a privately held 45-employee company.

First Alliance leases out IBM hardware and peripherals and markets Intel Corp. solid-state paging devices for IBM disk drives, as well as selling IBM 3480 look-alike tape cartridge drives from Aspen Peripherals Corp. in Boulder, Colo.

less.



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EDITORIAL

A long shot

ABOVE ALL ELSE, this is an election year. So the likelihood of passage of Sen. Daniel P. Moynihan's (D-N.Y.) bill to replace the controversial Section 1706 has to be considered a long shot at best in 1988.

The passage and outcome of the controversial tax section, which in the eyes of the Internal Revenue Service binds many formerly independent computer consultants to full-time employee status, has probably stirred more letters to *Computerworld* than any other issue in this decade. It was furtively slipped into the 1986 tax reform bill by Moynihan and has served to lop off a variety of tax breaks associated with self-employment. Apparently stirred by the opposition and resentment among consultants, Moynihan now seeks to make it easier for such consultants to retain their independent tax status.

But, as we noted, this is an election year. With congressmen eager to head home to fight for their own political lives and the presidential candidate of their respective parties, passage of any controversial legislation is highly unlikely.

And 1706 has certainly become controversial. Consultants, even if they work solely for one broker, are adamant about maintaining tax loopholes while the majority of taxpayers have to settle for a simplified deduction schedule. Software and services firms, which see such loopholes as an unfair advantage for consultants who could figure those tax benefits into lowered overhead, are likely to be just as adamantly opposed.

When 1706 was passed in 1986, there was no controversy because few were aware of it. This time around is different. There are two bitterly opposed sides, and Congress wants to wrap up the legislative year quickly. So don't hold your breath awaiting a quick election-year fix; in fact, it may be better to wait for the spring, because such fixes often hold unpleasant surprises.

Set priorities

Hostile takeovers are thankfully rare in the software industry, but Computer Associates' aborted attempt to buy Management Science America signals that we may be in for another round of nail-biting.

CA's record for acquisitions has been a mixed bag. At its best — such as in its buy-outs of Uccel and CGA Software Products Group — the company has put ample financial and marketing resources behind acquired products. At its worst — such as in the purchases of Software International or Sorcim, Inc. — CA has been happy with third or fourth place in a lucrative market.

It is not clear what CA saw in MSA. Many of the products it would have acquired overlap technology picked up in the Software International buy-out. But it is obvious CA is stalking big game as it marches toward its \$1 billion annual revenue goal. We can only hope that it is keeping strategic fit in mind as well as financial glory.



LETTERS TO THE EDITOR

Worker's issue

Your call for a unified effort to research the possible connection between health hazards and working on VDTs is admirable [CW, June 13]. Your call for doing "something right for millions of women and their future children" may be a bit misguided.

The issues concern possible hazards in the workplace. It is a worker's issue, not a woman's issue. If I were a male reading about the possibility of health hazards, I might worry about possible effects of VDT work on my potency, fertility, health or my future children.

Hooray for a unified effort. Three cheers for an international approach. Let's all do something right for millions of workers and their future children.

Marilyn Gelman Harelick
Fair Lawn, N.J.

Good track record

I am writing in regard to recent stories about South Africa [CW, June 20] and the article "MIS dream jobs still elude blacks" [CW, Jan. 18], which stated that "among MIS professionals, including programmers, system analysts, operations specialists and managers, fewer than 7% are blacks."

In my company's information systems installation, we have a significantly healthier record of employing blacks than those organizations on which you report — and we are a medium-size installation operating in a large life insurance company in Cape Town, South Africa.

A quick analysis of our information systems staff, from programmer to management, shows 15 out of 60 — 25% — are black, which is *Computer-*

world's term, not ours.

All employees were selected strictly on merit, mostly via a thorough aptitude test and screening interview. All are capable performers, and several have been with us for many years. Their contribution is valued — as we value the contributions made by all our people.

As an ordinary South African who has no special axe to grind, I remain bewildered by the moves toward sanctions against us and by the hysteria and real hatred that I perceive flowing from the U.S. to South Africa these days. In light of my company's track record regarding MIS employment and advancement procedures, which is not untypical of information systems installations here, is it not pertinent for corporate American MIS to take stock . . . and get its own house in order first?

D. Rose-Innes
Manager
Data Administration
and Training
Metropolitan Lewens Life Ltd.
Cape Town, South Africa

Premature demise

Another bleak forecast for the lowly modem was offered in the Trends article [CW, June 20]. Once more, a research house has found a reason to predict the demise of the modem.

The danger in such predictions is that some may take it seriously. This will cause users to look for modem alternatives when they should not; product developers to pursue other opportunities when they should not; and industry experts to sit around pontificating when they should be solving problems.

The modem will continue as a viable element in the well-de-

signed communications network, but with a different form and function.

Fortunately, the modem will prosper. Without it, Integrated Services Digital Network has no data transport. Modems have branched out, as have their contemporaries — computers, terminals, nodes and printers.

To consider voice-frequency modems only in a forecast is akin to looking at the future of Intel Corp. 8088-based personal computers only. Ironically, the phone-line modem will likely ignore this forecast and continue to prosper.

Gordon G. Hill
President
Independent
Telecommunications
Support, Inc.
St. Petersburg, Fla.

Show me the way

I am writing in regards to Jackie Reynolds' statement in her Viewpoint column that "A U.S. Army study of nine federal projects found . . . 29% paid for but not delivered" [CW, May 30]. Does anybody else know about this? I mean, does anybody really read Reynolds? No, what I really mean is, please send instructions on how, where and when to bid on the 29% of those Army projects that are not delivered.

Gopal K. Kapur
President
Kapur & Associates, Inc.
Danville, Calif.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.



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A document-first strategy may cure specification indigestion

JOHN BARNES



If you ever visit a software development shop and you want to hear a lot of complaining, just ask anyone about specifications and documentation.

In almost any shop, you can find several copies of the "Hippo chart" — a picture of a hippopotamus eating from a bucket of garbage. The pail is labeled "specifications," and behind the hippo is a large brown pile labeled "documentation."

The cartoon probably understates most people's feelings on the subject. Notice also that documentation and specification are at the maximum possible distance from each other — at opposite ends of the hippo — but are said to consist of similar materials.

Working on the documentation end, I once saw a situation in which a technical writer had to write part of a manual without a

Barnes is the Pacific Northwest area manager for ADG, a high-tech marketing organization based in San Pedro, Calif.

chance to become familiar with the program. When the discrepancy was found, the system analyst who designed the program exclaimed, "I wish it *did* do that!" Then she redesigned the program to fit the manual.

An entry-level coder I know confessed to me once that he really didn't know what the blocks of code he was writing were supposed to do until he read the rough draft of the tutorial.

Abstract idea

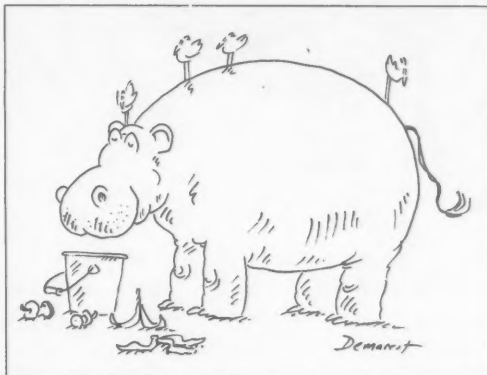
The above three observations make sense if you consider that the level of abstraction is much closer between specification and manual than between specification and program. A programmer, after all, worries primarily about how a program does something; analysts and technical writers worry about what it does.

A tutorial is an intensive walk-through with examples of the main things a program does. A manual is a detailed description of what the program can be expected to do in all circumstances, along with definitions of terms and descriptions of given procedures that should produce

given effects.

At this point, look at the definitions and ask, "Doesn't that sound like an extremely well-done specification?"

What if, on the next program to be developed from scratch, you were to put the system analysts together with the technical writers and have them write the manual and tutorial for the program before any programming was done? And then you used the manual and tutorial as a specification for the programmers?



CHRIS DEMAREST

The idea of a document-first strategy may sound absurd at first, but consider its possible advantages:

- **Clearer specification.** The biggest problem with almost all program documentation is what is taken for granted. Designers assume the programmer can read minds, but writers don't assume a naive user can.

- **Bolder, more advanced designs.** Designers sometimes work too closely with programmers and are subject to "whine-back," a low-level, negative feedback that saps the will to push things to the limit. "Couldn't we just . . . ?" "Wouldn't it be better in this version if we limited it to . . . ?" and so forth. A document-first strategy allows the concept to

grow as strong as possible without being subordinated to programmer convenience.

- **Keeping designers honest.** Sometimes, when the concept isn't clear, a deliberately vague specification is given to the programmers in the hope that they'll come up with something suitable. A manual, with its do-this-and-get-that approach, eliminates the room to hide.

- **Drawing on programmer strengths in a positive way.** A good manual tells you a lot about the software's design philosophy and about what the designers thought was important. It doesn't burden you with how the technical writer wrote code 10 years ago.

- **More informative manuals.** I do a lot of modeling. Quite often, the fine structure of a model's behavior depends on the exact algorithm that a program uses to approximate a mathematical function. On more than one occasion, that algorithm has been so poorly documented that nobody, even at the shop that wrote the program, has been able to tell exactly what it does.

- **Improved communication with management.** Managers who don't speak computerese — and even those who do — will actually be able to read the specifications comfortably and to solicit comment from a much wider community.

Is anyone trying this document-first strategy?

Mid-range price wars

Users are in a position to bargain with vendors

DALE KUTNICK



Trade press articles, consultants and even Wall Street analysts have recently predicted the demise of the minicomputer industry, a fate tied to PCs and microprocessor-based technology connected via LANs to servers and to Unix and RISC-based systems.

Start-up companies exploiting these technologies appear every week. Not only is there more competition in the mid-range market, but worldwide shipments by U.S. vendors will only grow about 8% to 9% this year, to about \$26.5 billion, vs. 11% in 1987. And IBM has become much more aggressive, heavily discounting the 9370 as a distributed processor.

The well-regarded Applica-

Kutnick is a data processing and communications consultant based in Redding, Conn. He was formerly executive vice-president of research at the Gartner Group, Inc. and co-founder of The Yankee Group.

tion System/400 should keep the 300,000 System/36 and 38 users on an IBM migration path and win its share of small and medium-size enterprise accounts — and even some large-company distributed sites.

The Personal System/2 Models 70 and 80, with IBM's OS/2 Extended Edition, will attack the PC LAN server market.

DEC and Hewlett-Packard are also in the midst of new product cycles and will price aggressively to win market share. Wang, Data General, Prime and others must follow suit. But DEC, IBM and HP should gain additional share between now and 1992. That leaves too many vendors chasing a smaller pie.

Armed for price war

The bottom line is that there will be a price war in the mid-range market within the next few months, extending well into the early 1990s. Vendors will be making more deals and changing their sales approaches. "Special bids" should become the norm for all users making significant acquisitions. All vendors, including IBM, will become more responsive.

The impending slow death of the traditional minicomputer vendors has been greatly exaggerated. The major companies are already implementing new technologies like RISC and the latest Motorola and Intel chips, and are developing Unix and PC LAN server strategies.

Most of the traditional minicomputer players have relatively large installed bases and in-place service, support and distribution capabilities. They still offer superior connectivity and office automation software as well as a wide range of business applications packages.

These advantages will only continue against Unix multiuser platforms for another 18 to 24 months. There is now so much software development money being spent on Unix that systems and utility software and applications will explode during the next two years — even in the DBMS and on-line transaction processing arenas.

Unix shortcomings can be buried in inexpensive, powerful RISC- and microprocessor-based systems that offer user-friendly front ends and are optimized to run Unix efficiently. Indeed, the mid-range market will be the most technology-intensive and innovative arena in the computer business. Price/performance ratios and costs of

ownership will be driven down, particularly at the low and middle ends of application-specific multiuser systems and technical markets, which are traditional mini-vendor strongholds.

But Unix and LANs will not be a panacea for most traditional mini vendors; users are already networking smaller systems together rather than installing high-end superminis, which are more profitable for the vendor to sell.

Mini vendors must manage operations for lower gross margins, which is a difficult adjustment. Some will be unable to make this transition and, when their stock price falls, will become acquisition candidates because of their installed base and other assets.

Evaluation criteria

Below are some of the critical success factors that can be used to evaluate a minicomputer vendor during the next three years.

- A well-developed Unix strategy, including high-level bridges between their proprietary operating systems and Unix.
- Exploitation and integration of Intel's 80286 and 386 and/or Motorola's 68060 and RISC technology in technical and multiuser commercial platforms.
- Product line consolidation — at least from a manufacturing

and software support perspective — to support focused research and development efforts. Users should be wary of companies spending less than 9% of revenue on R&D.

- A well-integrated PC LAN server strategy, including PC connectivity, minicomputer downsizing and using 68060, 286, 386 or RISC platforms.

- Systems integration capability — both at the component and system level — along with some distinguishable value added, like software, service and support. Strategic alliances will be most important here.

- A well-oiled distribution, service and support organization, including direct sale, value-added resellers, OEMs, third-party software partners, on-line problem solving and education.

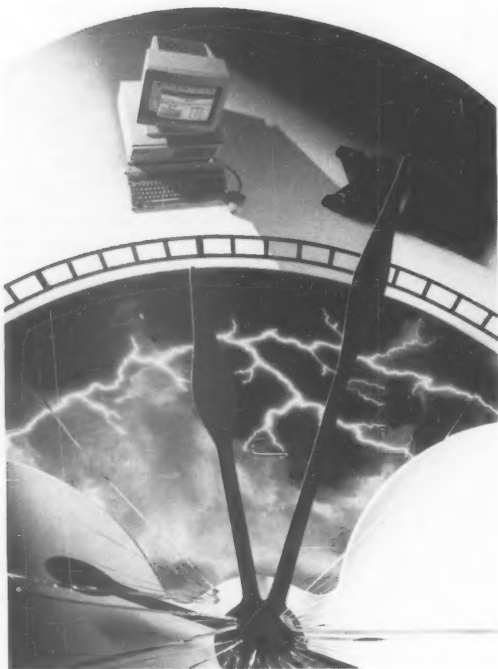
- Installed base loyalty. This factor is critical in enabling growth and investment.

- Networking standards adaptation and integration as well as IBM connectivity.

- Unique niches or products that enable superior focus, functionality or optimized performance.

Mini vendors, especially DEC and HP, are being caught in their own networking web. The traditional mini vendors must develop new strategies to expand their markets and maintain their installed base.

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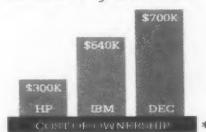
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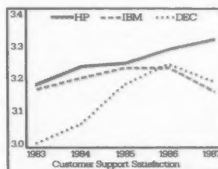
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SYSTEMS & SOFTWARE

HARD TALK

Stanley Gibson

Errors add up at Apollo



The company that was once a wonder boy now seems snake-bitten. Apollo Computer began life as the first engineering workstation company, the brainchild of start-up wizard John William Poduska.

Riding the crest of uninterrupted quarterly gains in 1984, Poduska boldly predicted that Apollo was headed in a beeline for the billion-dollar mark. Now at the helm of Stellar Computer, Poduska told me several months ago it gave him no joy to see that archrival Sun had made it to that milestone before Apollo. Sun, once an upstart with a spate of early problems, has moved into cruising speed and taken over from Apollo as undisputed No. 1 in the workstation market.

Since Poduska ceded control to Thomas Vanderslice several years ago, the firm has sometimes lagged behind Sun in price/performance. Nonetheless, few have criticized Apollo for being technologically out of it. Apollo has been knocked, however, for being outmarketed.

In addition, Apollo has been hit by a series of unfortunate incidents.

Continued on page 26

IBM widens relational lead

DB2, SQL/DS facing few true competitors in DBMS arena

ANALYSIS

BY CHARLES BABCOCK
CW STAFF

IBM's DB2 and its relational cousin, SQL/DS, are so successful in U.S. mainframe shops that

within another year, IBM may enjoy as dominant a position in relational data base management systems as it enjoys in mainframe teleprocessing monitors—a near monopoly.

The latest figures on licenses sold for DB2 and SQL/DS boost

their totals higher than previously published numbers and indicate that their growth continues unabated three and five years after their respective introductions.

SQL/DS steps out

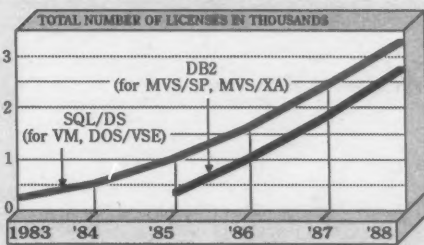
Shaku Atre of Atre/Computer Assistance, a Rye, N.Y., consulting firm with ties to IBM's DB2 development facility, said 2,800 licenses have been issued for DB2 and 3,300 for SQL/DS. These figures illustrate that SQL/DS, while in DB2's shadow, has also won widespread acceptance on the mainframe—primarily, it is believed, among VM users.

Focus Research Systems, Inc., a West Hartford, Conn., research firm, cites a total of 450 DB2 systems and 792 SQL/DS systems in its data base. These figures cannot be extrapolated

Continued on page 26

Ascendancy of DB2 and SQL/DS

Will IBM's relational products dominate mainframe sites?



INFORMATION PROVIDED BY ATRE/COMPUTER ASSISTANCE
CW CHART

Prime launches 5.8-, 8.5-MIPS processors

BY STANLEY GIBSON
CW STAFF

Prime Computer, Inc. will plug a gap in its 50 series product line today when it announces two systems that are capable of 5.8 and 8.5 million instructions per second (MIPS).

The 4450 and 6150, both uniprocessors, will stack up against the recently introduced IBM Application System/400 and the Digital Equipment Corp. 6600

and 8800 multiprocessor families, according to a Prime spokesman.

The systems will compete strongly with DEC, offering as much as a 30% price/performance advantage, said Sandy Gant, an industry analyst at Cupertino, Calif.-based Infocorp.

'Continuation'

"The products are just a continuation of what Prime is doing, constantly rolling out products

with better performance at lower cost," Gant said.

The new systems will run software written for other 50 series systems. In addition, Prime Information, a Pick Systems Pick-based environment, and Oracle Corp.'s Oracle relational data base will be offered with the new systems, according to Prime.

The office-environment 4450 and the mainframe-class 6150

Continued on page 27

Remote TV sites load up Atlanta

BY JAMES A. MARTIN
CW STAFF

ATLANTA — Cable News Network (CNN), headquartered right across the street from the Georgia World Congress Center, should have been in the catbird seat last week covering the Democratic National Convention.

Despite the convention's convenient location, however, the MIS, telecommunications and production staffs at Turner Broadcasting System, Inc. (TBS), CNN's parent, set up 11 remote trailers around the convention center, just as the other networks did, to handle the extra computing and video production demands.

Although NBC, CBS and ABC cut back their convention coverage this year, CNN promised gavel-to-gavel reports. The network assigned more than 300 people to the convention, from journalism interns to news producers, and it is from these "me-

Continued on page 28

Inside

- The AS/400: From inception to birth. Page 25.
- Sylogis introduces on-line sorting utility for CICS. Page 25.
- Concurrent expands product line. Page 29.

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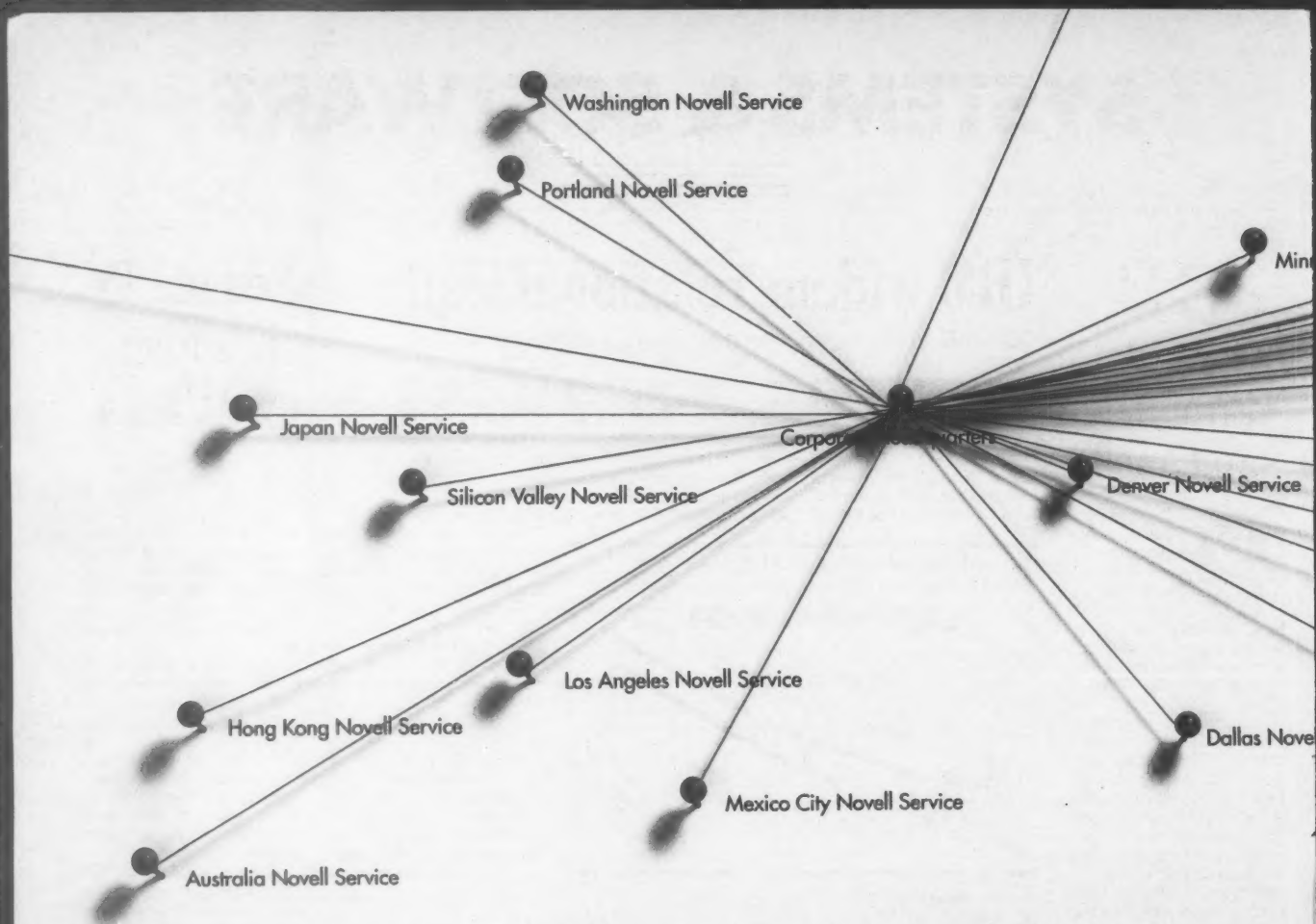
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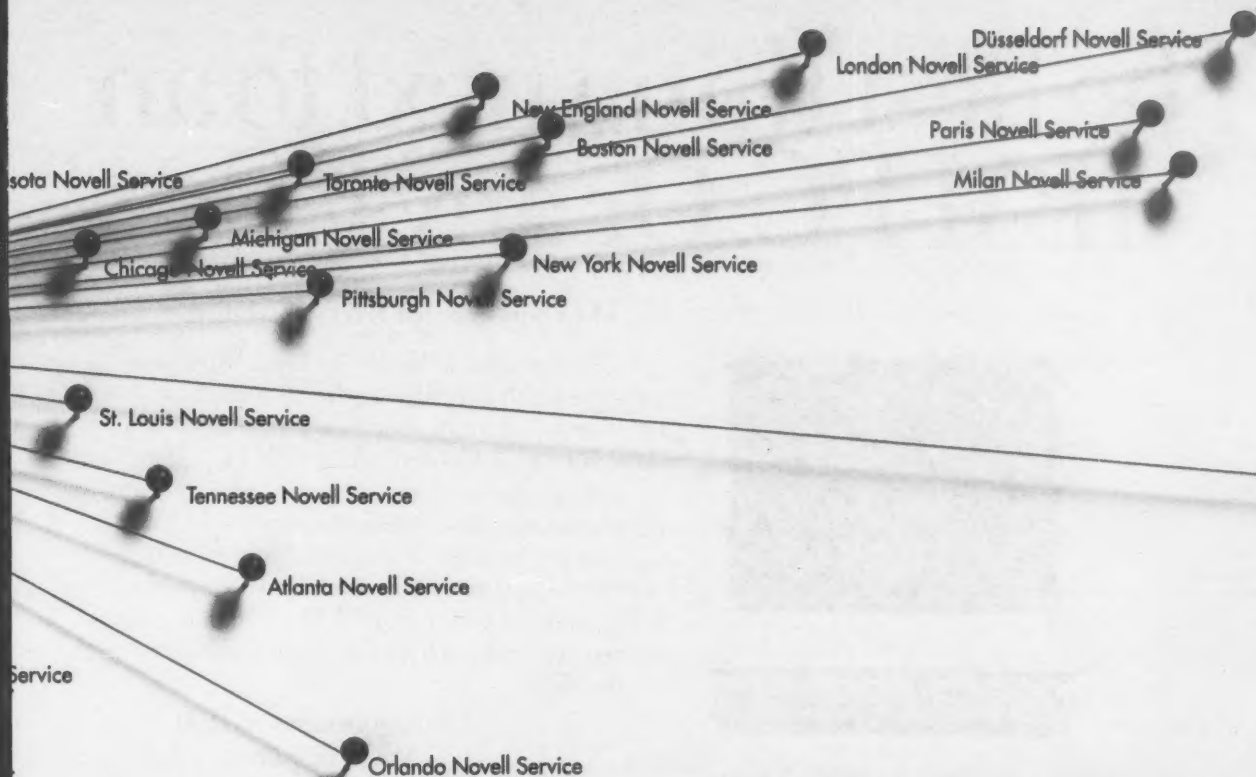
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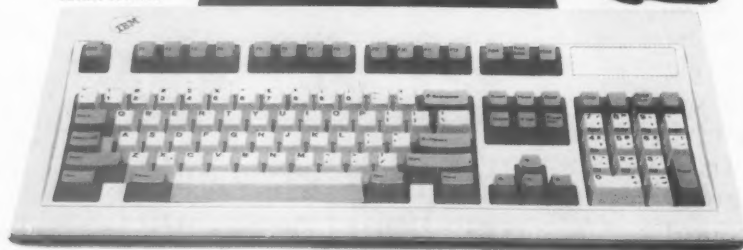
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Processors spring to life on robotic assembly line

BY STANLEY GIBSON
and JEAN S. BOZMAN
CW STAFF

ROCHESTER, Minn. — If you happen to visit IBM's Application System/400 production facility here, watch where you stand. A mobile robot — called a mobot — might ask you to get out of its way.

The mobile robotic carts that ferry AS/400 assemblies around this 3.4 million-square-foot plant — IBM's largest under one roof — are just one of many highly automated production aids used to make the AS/400 processor.

Fabrication of the AS/400 is carried out on a new just-in-time assembly line that incorporates elements of the Japanese "kanban" theory of manufacturing. Trays of parts are openly displayed so workers will know when it is time to order more.

Resource sharing

Ironically, the new AS/400 area is just across the floor from where the System/36 and 38 are still being made in limited production. Yet IBM 5363s — the System/36 entry-level machines — are made on the same assembly line as the AS/400 low-end Models B10 and B20. The 5363s are housed in a slightly different chassis than the B10s and B20s but contain the same printed-circuit boards, plant managers said.

Each AS/400 system is custom-ordered, its details and features outlined in a brief message carried over the Rochester factory's Token-Ring local-area network. IBM is using its own Personal System/2 Model 80 personal computers as file servers on the factory LAN.

Similar assembly lines are located in Santa Palumbo, Italy, where European AS/400s are

made, and in Guadalajara, Mexico, which serves the Latin American and Asian markets. IBM said workers are assigned to three full shifts in an attempt to build up AS/400 inventories.

IBM workers use plastic trays of parts — selected by others



The AS/400's software loading rack

farther up the line — to assemble parts for the finished product. Each AS/400 system's cabinet is labeled with a bar-code sticker identifying the model number and features.

Within several assembly steps, the system is ready to receive its operating system. The AS/400s — deployed over several layers of ceiling-high racks — receive system software from attached IBM Personal Computer ATs.

In a second step, ATs are also used to test each AS/400's circuits. When the process is complete, a robotic conveyor is signaled and returns to pick up the newly "intelligent" device for eventual delivery to the factory's shipping department.

Trumpeting AS/400 advances

IBM system incorporates 32-bit data path, new hardware, software ideas

ON SITE

BY STANLEY GIBSON
and JEAN S. BOZMAN
CW STAFF

ROCHESTER, Minn. — The marriage of IBM's System/36 and 38 technologies, which became the Application System/400, could not have happened without major advances in both hardware and software technology, IBM executives said.

During a recent *Computerworld* visit to IBM's laboratories here, development managers said it took the efforts of 32 IBM facilities — led by a Rochester development team — to bring the AS/400 to life within 28 months.

The enabling technologies included new packaging for System/38 printed circuits, a full 32-bit data path and the use of multiple microprocessor packaging concepts that began in the System/36.

'More than a 38'

"The architecture is based on a System/38, but it's much more than a 38," said Bill Kempke, high-end hardware product manager for the AS/400. "It has 32-bit arithmetic operations and full 32-bit I/O channels," Kempke added, which means the AS/400 has a data path that is twice as wide as the System/38's 16-bit data path and four times as wide as the System/36's 8-bit data path.

Like the System/38, the AS/400 has a built-in relational data base and 48-bit addressing. In addition, a new surface-mount technology, combined with new, highly dense bipolar chips, allowed for a 4-to-1 compression in board size compared with the System/38.



IBM's Kempke points at the AS/400's innards

Yet the AS/400 has three times the System/38's main memory, twice the speed and twice the reliability, Kempke said. "We think we've got an architecture that will take us to the year 2000."

In developing the new machine's OS/400 operating system, IBM's Rochester software designers were helped by hundreds of programmers at other IBM sites. One-third of the 1,500 programmers involved in the project came from an IBM software development facility in Toronto.

Other programming help came from Hursley, England, Tokyo and Gaithersburg, Md. At the peak of the project, 700 programmers were involved in testing alone.

The 6.9 million lines of code in the OS/400 operating system — compared with an estimated 20 million for a fully configured IBM MVS/XA operating system — contain RPG and Cobol compilers, the SQL/400 data base query language, application development tools, a built-in office system, security features and performance tools.

The operating system con-

tains support for high-level languages like PL/I and Pascal. Developers built on an initial RPG compiler and operator control language compiler that were constructed in 1985 to prove that System/36 code could be ported to the System/38 environment. By Christmas 1986, the first version of OS/400 was running on the AS/400 hardware design, Kempke said.

An unfriendly price

OS/400's user-friendliness, including extensive on-line Help, exacted a price in overhead, admitted Richard Sulack, product manager for AS/400 programming development.

The system's 47 tutorial modules require 2.6M bytes of memory, while the total OS/400 system needs 250M bytes. That represents nearly half the 630M bytes of memory that is packaged with a low-end Model B10 or B20 system, IBM said. "If you want to make a product easy to use, it's going to cost you in overhead," Sulack explained.

While modified, the AS/400's design is based on LM-bit bipolar chips similar to those used in the

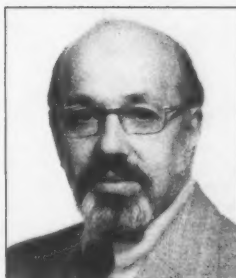
Continued on page 27

Syllog fills on-line sort vacuum

BY CHARLES BABCOCK
CW STAFF

HACKENSACK, N.J. — A small software firm noted only for a Cobol precompiler is introducing the first on-line sorting utility for IBM's 19-year-old CICS.

CICSORT intercepts the IBM Cobol runtime library subroutine that is invoked as a batch process by CICS when a sort needs to be performed. CICSORT substitutes its own on-line sorting routine for the batch process, speeding the return of sorted data to a CICS terminal user, according to Marty Goetz, Syllog chairman. Goetz was formerly president of Applied Data Research, Inc. in Princeton, N.J.



Syllog's Goetz

Since the inception of CICS, the SORT verb in Cobol has been banned from a CICS Cobol programmer's vocabulary because an attempt by CICS to initiate a

sort will crash the system. The programmer must write his own sorting routine or pull records in sorted order from VSAM files through secondary indexes, an inefficient maneuver.

Otherwise, sorting for CICS continues to be done off-line by various standard batch-sorting utilities, including IBM's DF Sort, Computer Associates International, Inc.'s CA-Sort and Syncsort, Inc.'s Syncsort, according to Goetz.

Sorting it out

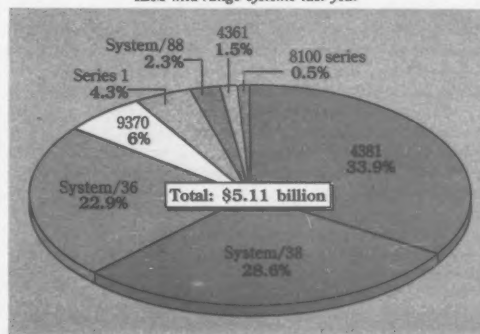
Priced from \$6,000 to \$17,000, CICSORT is not applicable to all sorting functions. Given its on-line nature, CICSORT is useful for

Continued on page 27

Data View

Slicing up mid-range sales

The 4381 edged out the System/38 for top dollar volume among IBM mid-range systems last year



INFORMATION PROVIDED BY INTERNATIONAL TECHNOLOGY GROUP
CW CHART

Lead widens

CONTINUED FROM PAGE 21

to cover the whole market due to the danger of multiplying any built-in error, but they do reflect a high installment rate for SQL/DS as well as DB2.

"It's only a matter of time before IBM will have sewn up the market," Atre said.

Martin Goetz, chairman of Syllog Corp. in Hackensack, N.J., pointed out that IBM has always enjoyed a 50% to 60% market share on the mainframe with its IMS and DL/I products.

Adding DB2 and SQL/DS to the mix is likely to boost that percentage higher, probably to the 60% to 65% range, Goetz said. "If 70% is considered a monopoly,

they have a good chance," he predicted.

In the strictly relational marketplace, there are few mainframe contenders. Oracle Corp. has still unproven aspirations for that market, and Relational Technology, Inc.'s Ingres is limited to VM on the mainframe. Cincom Systems, Inc. is the one competitor that appears to have established a toehold, but the 432 licenses sold for its Supra to date indicate that it is catching on slowly.

Cincom Chairman Thomas Nies pointed out recently that it took several years to develop Supra and said that companies just starting to develop a relational product will find the market has disappeared by 1992 or 1993.

Other companies — such as Goetz's former firm, Applied Data Research, Inc.

(ADR), Cullinet Software, Inc. and Software AG of North America, Inc. — will provide SQL interfaces to their products and continue to enjoy a piece of the action.

However, surveys of buying intentions indicate that interest in nonrelational systems is rapidly falling off. According to Focus Research, the percentage of buyers "planning to buy nonrelational" has dipped from 91% to 51% in the past four years.

Niche forming?

ADR spokesmen pointed out that not every mainframe customer wants to move to IBM's MVS/ESA, which is needed to run Version 2 of DB2, or buy IBM's most expensive hardware. The spokesmen said there will be a secondary market below

DB2 for products with relational characteristics.

George Schussel, president of Digital Consulting, Inc., said that if DB2 and SQL/DS have achieved a dominant position, it is because IBM launched reliable and advanced products and the independent vendors are trying to catch up. With IMS, it was the other way around, he noted.

The independent firms will find ways to compete on application development tools and utilities and, to a limited extent, in DBMS as well. IBM still falls short of a stranglehold, Schussel said.

"Users will be better off if it doesn't happen. We know from teleprocessing monitors that a competitive market is better than a monopoly," he said.

Gibson

CONTINUED FROM PAGE 21

cidents, none of which have been fatal but, when taken together, call the firm's management into question.

Several years back, some Apollo employees were caught in a cocaine transaction in the company parking lot. Last year, an official erred in foreign currency transactions, costing the firm several million dollars. Recently, a couple of German executives were sacked for misreporting a sale to an OEM, causing the firm to record a surprise quarterly loss. In the wake of this event, chief operating officer Roland Pampel resigned.

At the recent rollout of Series 3500 and 4500 workstations, an analyst asked if the firm could assure the audience that there were no other surprises in store.

Size justification

Vanderslice responded that investors wanting predictable quarterly results should buy a utility stock, not a high-tech stock. He went on to blame the smallness of the company for making slipups of \$10 million or so apparent on the company's bottom line.

Did he mean to say that in a larger company, it could have been swept under the rug? It sure sounds that way.

But wait a minute. Weren't Apollo's problems due to the fact that perhaps the wrong employees were hired and, once hired, weren't monitored closely enough? How else could their errors have eluded upper management? If Apollo were a bigger company, wouldn't it be even harder to tell what people were up to? Instead of one \$10 million loss, isn't it just as likely that Apollo would post 10 of these if it were 10 times its present size and the same managerial atmosphere prevailed?

Contrary to Vanderslice's assertion, neither Apollo's size nor its nature as a high-tech company can explain the severe employee errors that have occurred.

I asked Vanderslice if the series of blunders might be a result of a corporate culture that needs correcting. He said the firm has young, talented, bright people who sometimes suffer from inexperience.

Most high-technology firms employ bright young people by the thousands. Those people need leadership, guidance and inspiration from upper management. At some high-tech firms, they get it.

Are they getting it at Apollo?

Gibson is *Computerworld's* senior editor, systems & software.

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AS/400

FROM PAGE 25

IBM 4341, 4361 and 4381, Kempke said. The basic unit has 16M bytes of memory vs. 4M bytes per card on the System/38.

Keeping cool

To dissipate heat, the firm used a thermal conduction module in which the air is blown across the chip's cooling tower by a fan, just as it is in the IBM 9370, Kempke said.

The basic AS/400 hardware design borrows more heavily from the System/38 than it does from the System/36. But there are two areas in which the AS/400 resembles the System/36: distributed design and user-friendliness. Like the System/36, the AS/400 has a distributed-processor design using a total of 58 microprocessors.

The high-end systems — the Models B30, B40, B50 and B60 — use air-cooled, high-speed bipolar technology. In contrast,

the low-end processors, the B10, B20 and entry-level 5363, use CMOS technology based on a new generation of CMOS chips made at IBM's East Fishkill, N.Y., semiconductor facility.

Each of the CMOS 2 chips, as IBM calls them, has 40,000 cir-

“WE THINK we've got an architecture that will take us to the year 2000.”

BILL KEMPKE
IBM

uits on it, compared with 7,500 circuits on the high-end AS/400 chips. There is a tradeoff, however, in performance, Kempke said. Still, the CMOS design, coupled with a new type of double-sided, surface-mount circuit-board technology, makes the units so compact that they can fit into a file-cabinet-size chassis.

Syllog

FROM PAGE 25

sorting reports derived from random files, moving batch reporting into an on-line environment, entering data at a terminal for display in order or creating new files in sorted order, Goetz said.

Sort of confusing

“Sorts have been a basic utility from Day 1 in computing. . . I'm not sure why they were never made a part of CICS,” Goetz said.

Syllog officials are talking to IBM about the possibility of IBM making a standard interface available between CICS and CICSort, he added.

CICSort works with IBM's OS/VS Cobol and VS Cobol II compilers as well as with all versions of CICS.

Syllog said CICSort will be available under MVS Aug. 31, and a VSE version should be available some time in the fourth quarter.

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8/88 D3AU

Prime

FROM PAGE 21

will replace Prime's 9955 Model 2, a 5-MIPS system requiring a computer room. Both processors run the Primos operating system.

Unix in future

Unix support for all 50 series processors, including the new models, has been promised by Prime by early 1989.

The 4450 ranges in price from \$290,700 to \$349,800. The systems are offered with 32M bytes of memory, which is not expandable.

In an office environment, the

4450 can support 3G bytes of disk storage, but in a computer room, it can handle 12G bytes, according to Prime.

High-end options

The 6150, an entry-level computer-room system, represents the high end of the 50 series. The 6150 models contain from 32M to 64M bytes of memory and are priced from \$443,700 to \$550,000.

Prime spokesmen said the 6150 can support 24G bytes of disk storage and up to 512 terminals.

Both the 4450 and the 6150 are scheduled to ship to customers next month, according to the vendor.

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*UNIX System Fundamentals for Non-Programmers	January 6-8 February 17-19 March 16-18 April 20-22 June 13 June 25-July 1 August 10-12 September 21-23 October 26-28 December 7-9	January 13-15 March 23-25 June 13-15 August 17-19 September 28-30 December 14-16	January 27-29 April 22-24 June 27-29 August 31-September 2 October 12-14	\$585
*UNIX System Fundamentals for Programmers	January 18-20 February 22-24 April 4-6 May 2-4 June 8-10 July 18-20 August 22-24 October 3-5 November 7-9	January 18-20 March 28-30 June 13-15 August 22-24 October 3-5	February 1-3 April 11-13 June 27-29 September 5-7 October 17-19	\$585
*Shell as a Command Language	January 21-22 February 25-26 April 7-8 May 5-6 June 9-10 July 21-22 August 25-26 October 6-7 November 10-11	January 21-22 March 31-April 1 June 16-17 August 25-26 October 6-7	February 4-5 April 14-15 June 30-July 1 September 19-21 October 20-21	\$390
*Shell Programming	February 1-2 March 7-8 April 11-12 May 16-17 June 20-21 August 1-2 September 12-13 October 17-18 November 28-29	January 25-26 March 7-8 June 20-21 August 29-30 October 10-11	February 8-9 April 18-19 July 11-12 September 12-13 October 24-25	\$390
*Using Advanced UNIX System Commands	February 3-5 March 9-11 April 13-15 May 18-20 June 22-24 August 3-5 September 14-16 October 19-21 November 30-December 2	January 27-29 April 6-8 June 13-15 August 31-September 2 October 12-14	February 10-12 April 20-22 June 13-15 September 14-16 October 26-28	\$585
UNIX System Internals	January 25-28 February 29-March 3 March 28-31 May 9-12 June 13-16 July 25-28 August 29-September 1 October 11-14 November 14-17	February 1-4 April 11-14 June 27-30 September 5-8 October 17-20	February 15-18 April 25-28 July 18-21 September 19-22 October 31-November 3	\$880
*UNIX System Administration	January 19-21 February 23-25 March 29-31 May 3-5 May 31-June 2 July 19-21 August 23-25 October 4-6 November 8-10	February 9-11 April 19-21 July 12-14 September 13-15 October 25-27	February 9-11 May 3-5 July 26-28 September 20-22 November 8-10	\$585
*C Language Programming	January 11-15 February 8-12 March 21-25 April 25-29 May 23-27 July 15-19 August 15-19 September 26-30 October 31-November 4 December 12-16	February 22-26 May 2-6 July 25-29 September 26-30 November 7-11	February 29-March 4 May 16-20 August 9-12 October 3-7 November 21-25	\$975
*Advanced C Programming Workshop	January 4-5 February 8-9 March 14-15 April 18-19 June 6-7 June 27-28 August 8-9 September 19-20 October 24-25 December 5-6	February 15-16 April 25-26 July 18-19 September 19-20 October 31-November 1	February 22-23 May 9-10 August 1-2 September 26-27 November 14-15	\$390
*Advanced C Programming under UNIX	January 6-8 February 10-12 March 16-18 April 20-22 June 8-10 June 29-July 1 August 10-12 September 21-23 October 26-28 December 7-9	February 17-19 April 27-29 July 20-22 September 21-23 November 2-4	February 24-26 May 11-13 August 3-5 September 28-30 November 16-18	\$585
*386	January 4 February 15 March 14 April 18 May 31 June 27 August 8 September 19 October 24 December 5			\$195

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CONTINUED FROM PAGE 21

dia village" trailers that the convention news stories were written and videotape coverage was edited for airing on the cable television news service.

Zoom lens

"Even though we are practically sitting on top of the convention, we had to build major remote setups for the control room, assignment desk and tape editing," said Fred Gamel, telecommunications manager at TBS.

This way, Gamel explained, "CNN can continue with its 24-hour news shows while 300 people are working the event and putting an extra strain on the system."

Specifically for the Democratic and Republican conventions this year, the TBS MIS department purchased an additional 30 Digital Equipment Corp. VT220 terminals and installed them in the trailers. The terminals, for CNN correspondents, are connected to an AT&T System 85 private branch exchange (PBX) in the South Tower of the CNN Center.

Plans for the future

The PBX — which is linked by fiber-optic cables to the three Parallel Systems, Inc. 200XR news production systems that reside in TBS's data center in the North Tower — is located away from the main hub of activity as an anchor for future data center growth in the South Tower, according to Gamel.

cording to Gamel.

"We have added some concentrators and terminals to the system, which puts a heavy load on it," said Michael F. Johnson, corporate director of MIS and telecommunications. "But the system has plenty of available memory and capacity," he said.

To handle the constant fluctuation, Johnson and his staff are in the process of putting together what he called a flyaway system. TBS is "working on having a core group of equipment, including a phone system and computer terminals and concentrators, that we can ship out on an hour's notice to just about any place in the world," he said.

Commonplace activity

Handling an influx of new users is becoming routine at TBS, special events aside. This summer, the company brought in its first mainframe, an IBM 3081 Model K, which it said will support not only the Atlanta-based corporate applications but 62 remote users in the Turner Entertainment Co. offices in Culver City, Calif., as well.

Previously, the company had been running its financials and other corporate applications on an MAI Basic Four, Inc. minicomputer for the past eight to nine years.

In addition, TBS has 200 to 250 microcomputers throughout the company. The number of Apple Computer, Inc. Macintoshes is nearly equal to the number of IBM Personal Computers and compatibles at TBS.

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NEW PRODUCTS — SYSTEMS

Processors

Concurrent Computer Corp. has expanded its computer product line with the introduction of the **Model 3280RG**.

The unit is targeted to operate in rugged environments within the aerospace and defense sectors and is said to be ideally suited for time-critical applications such as command and control, air management, test beds, tactical communications and weather predictions.

The product was designed to meet Tempest specifications and is available with up to 32M bytes of directly addressable main memory. The system supports Concurrent's OS/32 real-time operating system as well as Ada, Fortran and C. Support is also offered for IBM Systems Network Architecture and Transmission Control Protocol/Internet Protocol.

The Model 3280RG is priced from \$225,000.

Concurrent Computer, 106 Apple St., Tinton Falls, N.J. 07724. 201-758-7000.

Data Storage

Danbus Memory Systems Corp. has announced the development of the **Magnum 357 Compact**, an 8-in. disk for high-performance applications.

The drive reportedly stands 2.7 in. high, occupies 235 cm of space and weighs 6.3 pounds. Five surfaces are used for data, and two thin-film heads are used on each surface. Up to eight 400M-byte drive units may be arranged to form a 3.2G-byte memory module, and up to four modules can be configured to form a 12.8G-byte central memory.

The Magnum 357 Compact costs from \$8 to \$12 per megabyte.

Danbus Memory Systems, P.O. Box 10005, Suite 3010, 700 W. Georgia St., Vancouver, B.C., Canada V7Y 1A1. 800-663-4353.

The availability of the **2145 GCR** magnetic tape unit for use with all Unisys products based on the Unix operating system has been announced by **Unisys Corp.**

The magnetic tape unit, previously used only with the vendor's low-end A series mainframes and Unisys 7000/50, 51 and 52 systems, is now available for Unisys 5000/30, 50, 55, 85, 95 and 6000/50 machines. The tape can also be used with A 1, A 4, A 6, A 2, A 3, A 5 and A 10 mainframes. According to the vendor, the unit reads and writes at 50 in./sec. with an autospeed capability to 100 in./sec. The drive comes in a stand-alone model for low-end A series mainframes.

Pricing information is available from the vendor.

Unisys, P.O. Box 500, Blue Bell, Pa. 19424. 215-542-4011.

I/O devices

A point-of-sale bar-code reader that was designed for inventory tracking and report generation applications has been announced by **Kimtron Corp.**

Called the **KBR-100**, the device can be used with all Kimtron KT series terminals and includes seven selectable code symbologies. Features include ASCII and scan code selectability and a switch-selectable on-and-off carriage return. The

stainless steel tip wand is 7.6 in. long and has a 6-ft coiled cord. The product does not require an RS-232 port or additional power.

The KBR-100 costs \$499. Quantity discounts are available.

Kimtron, Building 380, 1709 Junction Court, San Jose, Calif. 95112. 408-436-6550.

A printer that allows corporations to print checks or any other business forms from blank paper has been announced by **Digital Design, Inc.**

The **Model 636** is said to be compatible with Hewlett-Packard Co.'s HP La-

serjet Plus and has the ability to produce bank checks from blank paper, the vendor said. Checks cannot be printed unless the security cartridge is plugged into the cartridge slot, and the signature cartridge may be locked in a desk until needed.

The printer comes with both parallel and serial interfaces and has a duty cycle of 10,000 page/month.

The Model 636 costs \$5,995 for a base configuration. The security cartridge costs \$995.

Digital Design, Suite 101, 2955 Hartley Road, Jacksonville, Fla. 32217. 904-268-4307.

Power supplies

Nova Electric, Inc. has announced the

Galaxy 3 kVA uninterruptible power supply (UPS), which was designed for mounting in a 19-in. equipment rack. The product will be distributed through OEMs, value-added resellers and systems integrators.

The UPS is an on-line system said to provide complete isolation from line noise and power outages, independent of switching functions.

The unit will operate at 120, 208 and 230 VAC and at 60 or 50Hz. The product is suitable for computer applications, telephone systems, radio and data communications and radar and security systems, the vendor said.

The Galaxy 3 kVA UPS costs \$4,995. Nova Electric, 263 Hillside Ave., Nutley, N.J. 07110. 201-661-3434.

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NEW PRODUCTS — SOFTWARE

System software

Landmark Graphics Corp. has announced **Openworks**, a software architecture for creating an entire model of the earth's subsurface. The product is targeted solely at the oil industry, the vendor said.

The Openworks environment was developed in conjunction with Cogniseis Development, Inc. to provide geologists, geophysicists and petroleum engineers with easy and rapid access to data and applications necessary for exploration of hydrocarbon reserves. The turnkey solution

is currently implemented on an IBM RT Personal Computer platform under AIX.

The company has also entered into a joint development project with Cray Research, Inc. in an effort to extend the Openworks system to Cray supercomputers under Unicos.

According to the vendor, the product incorporates a software bus concept that allows all new applications software to be automatically integrated with existing programs. A common user interface requires the geoscientist to learn only one point-and-click methodology for all computer-related operations.

The Landmark Openworks Software

Architecture Developer's Kit costs \$31,500.

Landmark, 333 Cypress Run, Houston, Texas 77094. 713-579-4700.

Data base management systems

Intex Solutions, Inc. has added to its line of DB2 and SQL companion products with the announcement of **SQL:Docu-fact**, which was designed as a data administration and maintenance tool in versions for both IBM DB2 and SQL/DS.

SQL:Docu-fact reportedly permits users to identify and enumerate the contents of data base tables while retaining dependent elements such as views, indexes, authorization grants and comments.

Data may be transferred to other systems, including personal computers and mainframes, by translating SQL data into the commas-delimited format. The product also provides audit trail facilities.

SQL:Docu-fact costs from \$200 to \$500 per monthly site license, depending on group number.

Intex Solutions, 161 Highland Ave., Needham, Mass. 02194. 617-449-6222.

Development tools

Simucad, Inc. has announced a new generation of its Silos logic and fault simulator.

According to the vendor, **Silos II** is an advanced system for multilevel simulation from behavioral- through switch-level circuit descriptions.

Rewritten in C, the product is said to offer a performance improvement of five to 10 times over previous versions of Silos and most other logic simulators. The simulator now includes a behavioral modeling language, SBL, to aid in system design. The language includes type checking, interpretive operation and an integrated debugger. Silos II provides both an integrated concurrent and statistical fault simulator and offers the user a variety of analysis options.

Silos II will cost from \$11,000.

Simucad, Suite 200, 1040 Marsh Road, Menlo Park, Calif. 415-321-2350.

Languages

Hewlett-Packard Co. has announced the availability of its fourth-generation language on its HP 3000 Series 900 Precision Architecture computers.

The product, **HP Allbase/4GL**, reportedly offers increased functions for program development with HP Allbase, a network-model data base management system for the HP 3000 family. HP Allbase/4GL was previously called HP Today and was targeted at the HP 9000 Series 800.

The vendor claimed the fourth-generation language can now be used across all HP Precision Architecture systems for both general business and technical applications. HP Allbase/4GL will be available in both developer and runtime-only versions.

HP Allbase/4GL runtime versions will cost from \$4,100 to \$8,900. The developer versions will cost from \$20,000 to \$44,000.

HP, 3000 Hanover St., Palo Alto, Calif. 94304.

Applications packages

Honeywell, Inc. recently released **Looptune**, a software application package that the vendor said enables users to automatically tune process control loops.

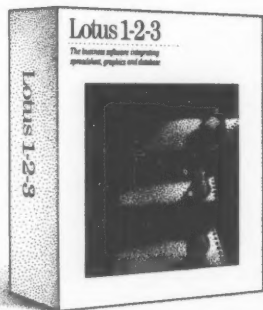
The product reportedly tunes proportional integral derivative control loops in any Honeywell TDC 3000 computer system controller file or in the application module.

Control performance can be optimized by adjusting the controller tuning constants to minimize control error or output swings. The software comes with full documentation regarding installation and operation.

Looptune costs \$15,000.

Honeywell, Industrial Automation Systems Division, 16404 N. Black Canyon Highway, Phoenix, Ariz. 85023. 602-863-5144.

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MICROCOMPUTING

MICRO BITS

Douglas Barney

Illogic sides with OS/2



Unix coulda been a contender. The pundits are having a field day with recent developments in

Unix. It seems that everyone has fallen in love with Unix while IBM and Microsoft's OS/2 remains stuck in first gear because of a shortage of applications and the lack of the critical Presentation Manager graphical user interface.

Where OS/2 needs applications, Unix has 'em. And where OS/2 must be enhanced to become truly multiuser, Unix already is.

So to the pundits, it seems obvious that Unix will hurt OS/2's chances of making a real run for it in the workstation market. This view is entirely logical, which is exactly why it is probably dead wrong. The computer industry has never been driven by logic and has rarely adopted the products that really made the most sense.

The pundits are ignoring this trait and are also forgetting about the inertia that the still-largely unused OS/2 operating system has built up. While most users have not implemented OS/2 yet, they have invested in

Continued on page 37

Mac-style chips arise in the East

Taiwan's Happy Joiner announces Apple-compatible gate-array chip set

BY ALAN J. RYAN
CW STAFF

It is something that no one had been able to do both legally and successfully, but that did not stop a Taiwanese vendor from introducing two Apple Computer, Inc. Macintosh-compatible gate-array chip sets last month.

And while others, particularly a small Brazilian outfit, have run into legal troubles from Apple for cloning activities, the Taiwan firm said it is not fearful because its chip sets do not violate existing Apple copyrights.

But one thing Happy Joiner Co. has yet to clone is the Macintosh ROM BIOS, critical to running Macintosh applications. Un-

like IBM, which many believe lost its standard to a plethora of clones, Apple has managed to hold its proprietary lock on the Macintosh architecture. Atari Corp., however, is able to emulate the Macintosh with its Atari ST but requires users to buy Macintosh BIOS software from computer dealers.

On stage

Attendees of last month's Taiwan Computex show who went to the Happy Joiner booth saw both the chip sets and a prototype Macintosh compatible, according to "Asiatrends," an Asian Sources Computer Products newsletter published by Trade Media Ltd. in Hong Kong.

According to the "Asiatrends" report, Happy Joiner, an uninterruptible power supply vendor, is selling a real-time clock chip and a floppy-disk controller that can manage two 800K-byte Macintosh standard floppy drives.

The chips were manufactured in the U.S. and were not designed by Happy Joiner, the report said.

Chips for sale

In the newsletter's interview, Happy Joiner Vice-President Marc M. Hara said the chips will be available to anyone who wants to design a legal Macintosh BIOS and legal software to run it.

The company will not sell Macintosh compatibles, he said, but will sell its wares to other Asian manufacturers that could use them as the foundation of Macintosh clones.

Pam Miracle, corporate relations manager for Apple's Pacific Group, cautioned that there are several instances that she can recall involving rumors of other Macintosh-compatible products that were not compatible upon close examination.

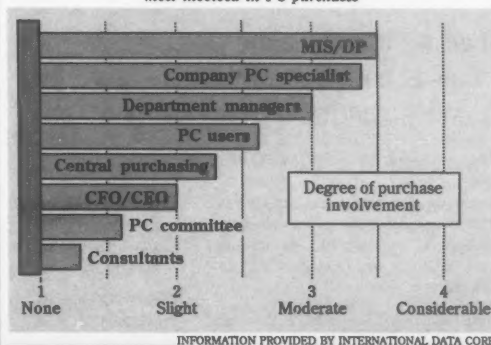
Inside

- U.S. Army division uses Displayform II to conquer paper mountain. Page 33.
- PC-based staff management systems targets MIS execs. Page 35.
- Realia, XDB Systems announce SQL Cobol preprocessor. Page 38.

Data View

MIS gets in on the act

According to a recent survey, MIS/DP is the employee group most involved in PC purchases



Rumors of PS/2 bugs squashed

BY ALAN J. RYAN
CW STAFF

IBM boasts about the reliability of its Personal System/2s because of the surface-mount technology used in building them. But it seemed like the much touted reliability hit a snag when a published report said users and dealers were again experiencing problems with the PS/2 Model 60s, a report that IBM heatedly

denied (CW, July 18).

Model 60s have had some problems in the past, but this time it seems the IBMers are right.

The report said IBM quality control representatives were meeting with dealers to iron out PS/2 bugs and solve system board availability problems, but none of the dealerships contacted by *Computerworld* were familiar with the meeting.

IBM "called a meeting with a few dealers; we do it periodically," said IBM spokesman Scott Brooks. But Brooks denied reports that the meeting had been demanded by an unnamed, disgruntled dealer who had demanded a meeting to discuss technical problems. There is no

Continued on page 35

How Micro Focus COBOL helped the U.S. auto industry get up to date with Just-in-Time Manufacturing

In 1984, Ted Annis and Gail Jackson founded Supply Tech to develop software that would provide communication of business documents between parts suppliers and the major U.S. automakers.

With the release of its ST1 product, Supply Tech had the cost-effective application that suppliers needed to service the Big 3 automakers' mandate for Electronic Data Interchange (EDI) software to make Just-in-Time manufacturing possible.

Annis and Jackson agreed that COBOL was the right choice as their development language. "When used properly COBOL lends itself to self-documentation which means easier implementation and maintenance."

Jackson, Supply Tech's President and head of product development, was already familiar — and dissatisfied — with another COBOL. But Micro Focus COBOL had the mainframe COBOL commands they needed. "Micro Focus also offers additional capabilities via standard routines so that you can do most things in COBOL that you can usually do only from a lower-level

language," Jackson notes. "And no matter how technically sophisticated they are, our mainframe programmers just go crazy over the Micro Focus Editor and ANIMATOR."

Supply Tech's new STX12 product is a generic EDI system that is opening up new markets for the company. Productivity increases from Micro Focus COBOL have made it easy for Supply Tech to expand its product line.

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Gail Jackson, President
Supply Tech

10

Looking at CASE tools? Ask these 10 tough questions before you buy.

1 Can we get all the tools we need?

Most CASE tools handle only isolated parts of the development process. These tools can improve productivity to some extent. But as long as other steps must be done manually or you must rekey information to move between lifecycle stages, you lose many of the benefits of capturing information with the tool. To get the full advantage of CASE technology, it's best to have tools for every stage of application development.

KnowledgeWare's tool set covers the complete lifecycle - from planning to the generation of executable COBOL code.

2 Can we get just the tools we want?

With some CASE tools, you may be required to buy more capabilities than you need. That's because some vendors have locked together tools for discrete development steps. So if different people do analysis and design, for example, you may be forced to provide everyone with a tool that does both.

KnowledgeWare's CASE solution is modular with separate tools for planning, analysis, design, and code generation that can work together...or alone. KnowledgeWare is unique in its ability to offer both the integration of a one-vendor solution and the flexibility of product modularity. So you aren't forced to buy more than you need.

3 How well are the tools integrated?

Most CASE tool vendors offer tools that aren't well integrated with each other. But if you can't easily pass information from one tool to another, much of the expected increase in productivity and system quality will be lost.

KnowledgeWare's CASE solution is integrated to allow information to flow naturally from planning through detailed design and system construction. Each tool contributes to a growing body of knowledge stored in the Encyclopedia. As information is updated by one tool, the change and its affects are reflected in all other tools that use that information.

4 How are diagrams stored in the tools?

The real value of diagrams in application development is the meaning behind those diagrams. A tool that stores the meaning of diagrams has numerous advantages over one that merely stores pictures of diagrams.

KnowledgeWare tools use artificial intelligence technology to store the meaning of diagrams, not just the graphical representation. The Knowledge Coordinator™ translates your diagrams into Encyclopedia information that can drive the system's construction. And the Knowledge Coordinator can take the information from any one diagram and automatically redraw it using a number of other diagramming techniques. This allows you to present diagrams in a form that best communicates ideas to each particular audience. And it saves countless hours of time.

5 Will the tools work with our current methodology?

Many CASE tool sets are tied to a specific methodology. To use them, you have to change your methodology to conform to the requirements of the tools. But you shouldn't have to learn a totally new methodology in order to get the advantages of CASE.

KnowledgeWare's CASE solution is not linked to a specific methodology. Nor should it be thought of as a replacement for your company's existing methodologies and development techniques. KnowledgeWare's tools provide an environment where engineering-like discipline is used to integrate existing approaches. So you can use any of today's popular methodologies, and capitalize on the experience you already have in your shop.

6 Can we introduce the tools at any point in the development cycle?

Some CASE tools require you to follow a rigid development process step by step - even if you wouldn't normally use some of these steps. For example, if you want to do some design before you get into system analysis, these tools may not allow it. Some force you to start using the CASE tool in one stage before you can move on to another.

Each of KnowledgeWare's CASE tools is tied to the others through a common Encyclopedia. And you aren't forced into a strict series of development stages. You can start wherever you like and even work backward through much of the tool set. For example, if you're in the design stage of an application right now, you can enter your current work into our tools at this point. You can work back through analysis if you choose and make use of the information collected in design. Many companies like to be able to "pilot" a particular phase of a development project to demonstrate the value of CASE technology. Our tools allow that.

7 Can the tools help improve system quality?

Some of the tools available today are simply diagramming aids. In order to improve the quality of applications, the tools should be able to check for consistency and correctness.

KnowledgeWare's tools use artificial intelligence technology to provide real-time checking of consistency and correctness of diagrams as they are created. This ensures the diagrams you draw represent information systems that can actually be constructed. You can concentrate on system concepts rather than structure details. Plus, it catches errors early in the development process, where they are far less costly to fix.

8 How friendly is the user interface?

The CASE tools you select should communicate ideas as clearly as possible. And the tools should make it easy for users to manipulate and modify these ideas. Unfortunately, most CASE tools have not kept pace with the latest advances in user interface technology.

KnowledgeWare's CASE tools use windows to allow you to view many diagrams and definitions at the same time. And to make it easy to tell diagrams apart at a glance, each can be displayed in a different color. You can zoom in on a particular diagram or nest several on the screen. And if you want to focus on a particular aspect of the application, you can mask out distracting elements in the diagram or highlight the path of information through a number of diagrams. Our tools are mouse-driven and have pull-down menus, making them fun and easy to use.

9 Can we exchange data with other software we already have?

Many CASE tools say you can do this. But most tools only make information from their tool available through specific interfaces to other products. The CASE vendor may not even provide an interface to your particular software. The tools should also let you bring in information captured in other software tools. Many CASE tools cannot support that.

KnowledgeWare products provide flexible import/export capabilities. This type of facility ensures you can exchange information with your existing database management systems, fourth generation languages (4GLs), data dictionaries, etc. Our tools help you take full advantage of all software in your shop.

10 Is there a plan for future advances?

Ask CASE vendors about their future plans. If they can't give you definite answers, there may be problems with expansion of their existing products. They may lack the underlying architecture to meet your demands for better products in the future.

KnowledgeWare has been following a master plan since its beginnings in 1979. We will continue to add even more capabilities to our current tool set. More powerful commands, even more diagramming techniques, and more user customizable features. Work is now under way to take full advantage of emerging technology such as IBM's SAA, OS/2, and Presentation Manager. This will lead to faster and even more powerful tools in the future. Software is our only business.

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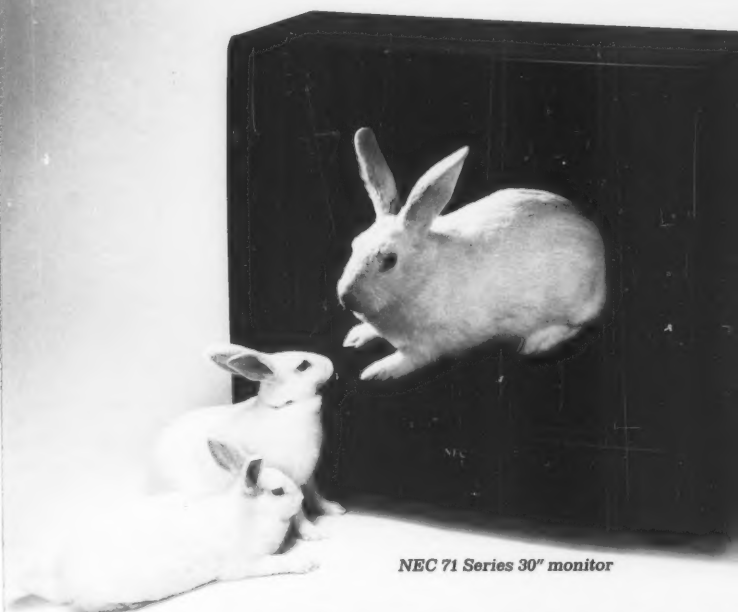


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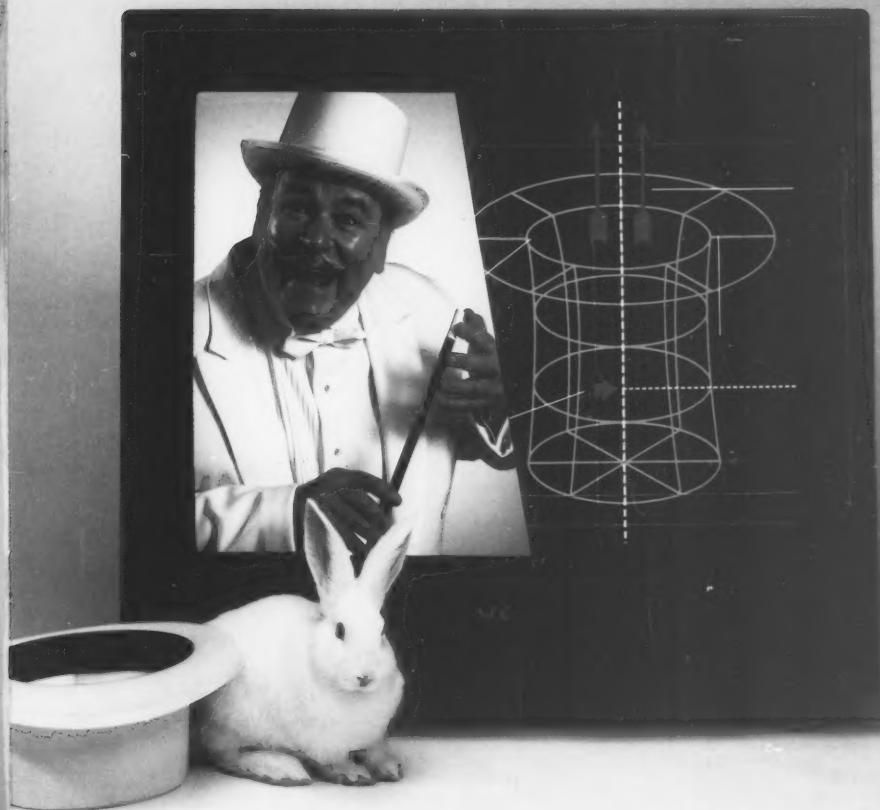
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Both projectors feature NEC digital point/zone convergence. During set-up and presentation, all functions are handled by remote control.

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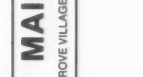
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SMALL
TALK

William Zachmann

Mac eases
PC blues

Some recent software updating chores reminded me of something I hadn't thought about much recently: The Apple Macintosh is a

heck of a lot easier to use than "standard" IBM Personal Computers.

There were two basic and similar chores that reaffirmed this particular belief. One was updating Microsoft's Windows/386 on the Compaq, AST and Dell systems I normally use in my work. Another was updating the Macintosh Plus, which I use to try out Mac software, with the new Version 6.0 Apple system software.

Both updates generally went smoothly. Although both had minor glitches, the PC was the glitchier of the two.

Fortunately, the latest version of Windows/386 has the most complete setup procedure yet seen on a Microsoft Windows product. It does a nice job of figuring out your system configuration without the user having to ask. Still, I did run into one problem and one uncertainty.

To fully describe the PC update, you'll have to bear with me a bit. But this three-paragraph explanation will support the thesis that the PC is simply harder to work with than the Mac.

To begin with, I installed Windows/386 on the Compaq Deskpro 386/25 from the 3½-in. B drive. You just switch to the B drive and type "Setup" to start the installation. Throughout the main part, the Setup procedure just kept asking for various disks in the B drive.

At the end, however, when it offered to update my CONFIG.SYS and AUTOEXEC.BAT files and I replied "Yes," the Setup routine wanted the setup disk in the A drive and refused to do anything but abort the entire installation procedure. I had to use a DOS "AS-SIGN A = B" command to get Setup to work off the B drive.

I knew I couldn't run the Compaq extended memory manager (CEMM.SYS) with Windows/386, but I wasn't sure whether I should eliminate the Compaq cache program too. I'm still not sure, but for the time being, I've left them both in.

Installing the Macintosh Version 6.0 system software was simpler. All that was re-

Continued on page 34

Army blasts paper piles with forms processor Displayform II

BY ALAN J. RYAN
CW STAFF

FORT HOOD, Texas — When Maj. Robert Hanssen, chief information officer of the 2nd Armored Division of the U.S. Army at Fort Hood, started thinking about ways to cut costs, he thought of the Army's endless mountain of paperwork.

The Army uses forms so frequently, Hanssen said, that in many instances clerical workers do 90% of their work on them. Thus, much time is spent filling out forms on typewriters or by hand.

However, by next year, Hanssen is hoping to make major changes with a product called Displayform II, a personal computer software package for forms processing from Deerfield Systems, Inc. in Utica, N.Y.

While PCs are used every day

to create and print documents, there has been no easy way to put an "x" in a box on a preprinted form, explained Chris Egger, vice-president of marketing at Deerfield.

Using Displayform II, the user can either print information on preprinted forms or scan and then print entire forms, including the filled-in text.

Easy transition

For Hanssen, the product will be an easy transition. There are already more than 500 PCs at Fort Hood, as well as laser printers and image scanners. With the scanner, any type of form can be scanned in and then output onto the laser printer with the information filled in. The package works with laser, dot matrix and daisywheel printers.

The Army takes the forms it scans in and sorts them into cate-

gories such as personnel, logistics, intelligence and operations. Then, using a data base management system on the PC network he has set up, Hanssen is able to import any data base or spreadsheet and export it in any format he desires.

"The operator doesn't have to go in there and write code to prepare a report," Hanssen said. "The user selects what he wants with a single key."

And like a spreadsheet, the package allows forms to do calculations, Hanssen said. When a form is set up, the operator can specify quantity maximums, so that when a cook is ordering food for the mess hall, for instance, he will not be able to incorrectly order more than is needed.

According to Egger, the forms processing market, which involves millions of preprinted paper forms currently in use, has

been estimated to be worth billions of dollars.

Some of those dollars are spent in Texas, and Hanssen said he will realize big savings using Displayform II. With the ability to print onto forms currently in stock, the Army will not have to add to the scrap heap its thousands of preprinted forms.

Also, "We don't need a forms library with a lot of blank forms. We can just send the forms to the server and let it print form and text on a laser printer on plain bond paper," Hanssen said.

With the scanning capability, it is easy to update or change forms as well, Hanssen said. To keep control of what types of forms enter the system, Displayform II comes with a setup package so a system administrator can scan in and edit forms and a separate package that allows users to fill in the forms.

Paperwork of another sort is holding up the transition to Displayform II at Fort Hood, though, Hanssen said. "There is a government moratorium on data processing purchases, which is why I don't have one copy on every PC here."

SoftPC for the Mac is ripe but bruised

Insignia's tool lets Apple PCs run MS-DOS, but it's not quite fast enough

BY JULIE PITTA
CW STAFF

It is the best of both worlds for some users of Insignia Solutions, Inc.'s SoftPC, a software package that allows Apple Computer, Inc.'s Macintosh personal computer to run MS-DOS applications. But for others, it is simply the slowest of the two worlds.

In addition to letting the Macintosh run many popular PC applications, the package may allow users within large corporations to sneak around Microsoft Corp. MS-DOS-only purchasing requirements.

Many users prefer the Macintosh for its ease of use, but must

conform to sometimes strict corporate standards that specify IBM or compatible systems.

But as one user has said, "If the Mac runs DOS, you can claim it's a clone, and that's that."

So far, SoftPC is the only software product allowing the Mac to run DOS applications. AST Research, Inc. offers two boards promising similar capabilities as well as better performance, but at a greater cost.

Mac 286 for Apple's high-end Macintosh II, a co-processor board that AST claims endows the Mac with the performance of an Intel Corp. 80286-based IBM Personal Computer AT, is priced at \$1,595 and has been shipping

since last fall.

A second product from AST, Mac 86, is priced at \$595 and is an Intel 8086-based coprocessor

Insignia Solutions' SoftPC

Price: \$695

- Runs on Macintosh SE and Macintosh II
- Requires external 5¼-in. floppy disk drive

board for Apple's less powerful Macintosh SE.

SoftPC was designed for the high-end Mac II but can also run on a Mac SE equipped with an accelerator board. The SoftPC package costs \$695. It also requires an external 5¼-in. external floppy disk drive.

Users said SoftPC appears to live up to its key claims — it does allow the Mac to run MS-DOS applications. However, those applications may not run nearly as quickly as they do on IBM architecture. And that can be troublesome to a user base accustomed to sub-second response time.

'Too slow'

"It's just too slow," said Sophia Ziburtovitz, a microcomputer specialist at McKenzie & Co., a New York-based management consulting firm. "We're looking at the AST board as an alternative. But my feeling is it's better to just run two systems, a Mac and IBM architecture."

"We're dealing with power

users here," Ziburtovitz continued. "People who are looking to build 50,000-cell spreadsheets — we really push our PCs. They want the best performance possible."

Chuck Maddox, a computer technician at the Illinois Science Academy, a public high school for students gifted in math and science, said the school is looking at SoftPC as a means of bringing both the Mac and MS-DOS experiences to its students.

"Different computers have different strengths and weaknesses," Maddox said. "I think it's important to understand both in the real world."

The academy has Macintoshes both in its dormitories and in the school's computer laboratories. The labs also house some IBM PCs.

For the academy, two computers are not better than one. "Instead of buying a Mac SE and a PC clone, we can buy a Mac II that can go both ways," Maddox explained. "It becomes a better performance value. It's also a matter of tidiness. It's one system on the desk top."

So far, Maddox has found the system runs DOS applications adequately, although more slowly than an IBM system would. "It's noticeably slower," he said.

Maddox said he is also concerned by the product's memory requirements — one version requires 2M bytes of random-access memory, while a more powerful version needs 4M bytes of RAM. Unfortunately, this can substantially add to the cost of using SoftPC, given the dramatic increases in memory prices. "Today, memory is worth its weight in gold," he said.

SOFT TIPS

Hide and seek

People using software such as Software Publishing Corp.'s Harvard Total Project Manager II often create immensely complex scenarios that can be aggravated by moving tasks around. If you have moved many tasks, you may find yourself with branches that do not lead anywhere and cannot be removed. What you are experiencing is a phenomenon called "invisible tasks."

To find the invisible tasks, place yourself on the "mys-

tery" branch and press CTRL-X. This will remove a task. Cursor along the branch until you reach a point where the task-name field goes blank. Do not be misled by <<no task>> in the field — it must be blank because it is the invisible task. Press F10 to remove it, and the branch will disappear with it.

Information provided by Corporate Software, Inc., a Westwood, Mass.-based software reseller.

Zachmann

FROM PAGE 33

quied was to insert the System Tools disk, drag its system folder over to the system folder on the Apple Hard Disk 20 and confirm that I wanted to replace existing files with the same name. Then I just restarted the system.

The glitch encountered with the Mac software came when I moved some of the new accessories from the Utilities disks. Suddenly there was a mysterious black rectangle around the cursor on the screen.

It wasn't until I'd dumped the hard disk System Folder into the garbage can and reinstalled everything again a couple of times that I accidentally discovered the problem. I learned, via the Control Panel from the system menu, that Closeview, which provides for magnification of portions of the screen, turns on automatically if you put it in the System Folder. Simply moving it into a separate folder returned the cursor to normal.

It's so easy

For me, both installations were equally easy (or difficult, if you prefer). On the PC, for someone who is not as familiar with Microsoft's MS-DOS and who doesn't have the systems and programming experience that I have, it would have been quite a different story.

But figuring out what was "wrong" with the Macintosh installation wouldn't have been necessary for anyone who read the manual (I didn't). There, it plainly states (in large letters, in fact, since a major motivation for including Closeview is to make it easier for those who are severely visually impaired to use the Mac): "Closeview is now installed. A thick rectangular outline, called the frame, marks off a small portion of your screen."

Moreover, even a quite inexperienced user could have easily discovered the message about Closeview in the Control Panel as I did. No special technical knowledge was really necessary, even for someone who, like me, didn't read the manual.

That could hardly be said for the Windows/386 installation, however. Anyone without knowledge of MS-DOS and the ASSIGN command isn't likely to be able to install the new Windows/386 from a B drive without help. Similarly, knowing what to do about the cache and memory management drivers can be fairly daunting even to a reasonably experienced user.

All of which is just one more indication of why more and more users seem to be switching to the Macintosh.

Zachmann is a senior vice-president at International Data Corp.

Samna Plus IV blends publishing, word processing

ATLANTA — A word processing program for The Santa Cruz Operation, Inc. Xenix operating system was recently announced by Samna Corp.

Dubbed Samna Plus IV, the system is slated to begin shipping this month and reportedly blends desktop publishing capa-

bilities with conventional word processing.

Samna said it hopes the software will help it get a slice of the fast growing market for Unix-type microcomputer-based systems.

The software includes the Samna Wordbase Manager,

which locates words and phrases stored on the computer.

Samna Plus IV also allows for the transfer of scanned images from Microsoft Corp. MS-DOS-based systems to those using Xenix.

According to the company, compound documents contain-

ing images can now be transferred between the two systems. The software supports the TIFF format, which is also carried by many popular scanners.

Samna Plus IV can work as either a single or multiuser system and ranges in price from \$695 to \$1,295.

SQL Performance for OLTP Tandem challenges anyone.

System's aim is MIS efficiency

SANTA MONICA, Calif. — Many MIS workers have climbed the ranks to top posts, helping to design or set standards for software that the company will use to increase efficiency. But few packages, if any, have been designed to increase

the MIS executive's efficiency.

However, one entry into this niche market is Microman II. This recently updated personal computer-based project and staff management system, designed for MIS executives, project managers and project adminis-

trators, sells for \$2,895.

According to Poc-It Management Services, Inc., the market potential for its software, which it claims is the first designed specifically for MIS use, is great. There are approximately 50,000 MIS departments in the U.S.

that have 10 or more programmers, Poc-It said.

The software, which was developed by Poc-It, is said to provide help in the following three areas: executive information for management of MIS; project management to schedule and track project work; and staff management to monitor resource use and staff planning.

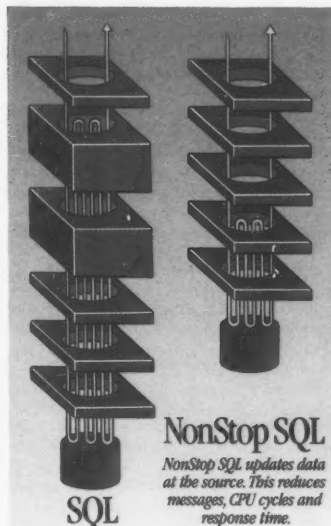
"The information needs of se-

nior MIS executives are different from those of middle management," a spokesman for Poc-It said. "While project managers need details about projects, executives need to monitor client service, measure staff use, perform staff planning and review project progress."

By tracking clients within the organization, Microman II measures the department's overall performance, the company said. Some of the things it will track are the speed with which orders are completed, whether or not projects are backlogged and cost to users for the technology.

Additionally, management reports — including cost and department performance reporting, work load and backlog reports, milestone reporting for large projects and summary reporting for small and medium-size projects — are included. Management can also determine time spent on support.

Microman II runs on IBM Personal Computers and compatibles; Unix and Xenix versions are planned. The package provides multiuser access on a local-area network, the company said.



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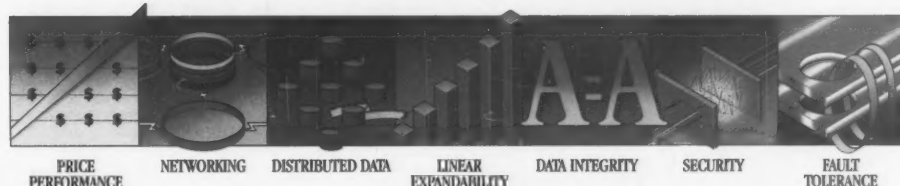
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PS/2 bugs

FROM PAGE 31

agenda for discussing quality problems, Brooks said.

Jim Dixon, president of Compucom Systems, Inc., a retail chain based in Dallas, said he has noticed no unusual problems with PS/2s in recent months. "Our problems have not been abnormal and are not out of line whatsoever," he said.

Diane Douglas, a spokeswoman at Computerland Corp., said she had not heard anything indicating the reported problems were being felt within the Computerland dealership network.

IBM further denied charges that it has been experiencing problems getting replacement parts for PS/2s to dealers. "We checked last week and this week and found no supply problem," Brooks said following the publication of the report.

In October, IBM had some problems with the Model 60 that have since been corrected, Brooks noted. "Since that incident, there have been no reported unusual problems," he said.

A *Computerworld* survey of PS/2 sites did not uncover any users who had run into the problems described in the report.

Ed Ginorio, manager of customer computing and support at Dun & Bradstreet Information Systems in Basking Ridge, N.J., said he has heard of a problem related to an external 5¼-in. third-party disk drive that will cause the PS/2 to produce false error messages. "The error doesn't exist," he said, "but according to the error, you need your system board replaced."

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Barney

CONTINUED FROM PAGE 31

machines to run it, mice to move cursors around and graphics for good looks. They've also invested time in learning about OS/2 and, in some cases, porting internal applications to the new system.

All this means that Unix, at best, will get a small slice of the high-end personal computer market. But Unix will never win over the general-purpose workstation market that will adopt OS/2 gradually during the next decade. Unix will, however, run roughshod over OS/2 in markets that seem to have a logical foundation — notably, the technical workstation and small multiuser markets.

Basic timing. When Microsoft announced Quickbasic 4.0 last fall, the firm took the opportunity to pitch Basic as the ultimate macro language and the batch language of choice for OS/2 applications. It also mentioned the possibility that Basic will serve as a data base development language and even put forth the notion that Basic was a better data base language than Ashton-Tate's Dbase.

Missing, however, were schedules. That is why we asked Greg Lobdell, group product manager for Microsoft languages, when we could expect such grandiose things from little ol' Basic.

According to Lobdell, the evolution of Basic into a macro language will occur during the next 18 months. During that period, Quickbasic 4.0-type technology will be used as an embedded macro language. But making Basic a super batch language for OS/2 will take longer. Sometime after those 18 months are up, Basic will have evolved into a sort of control language that would provide tight links between OS/2 applications.

For example, a user could write a macro that would go inside a word processor, get a chart from another program and drop it into a document, go off to E-mail the thing and then print it. At least there's one fun thing we know we can do in 1990.

Javelin tosses back. Javelin Software has not had it easy. In 1985, it introduced an arguably excellent product and for a while was the darling of the computer press. Unfortunately, Javelin could not break the stranglehold that Lotus's 1-2-3 has on the financial modeling market. With sales stagnating, Javelin found itself the target of an ever-vigilant press, which reported its problems to a community that values such information.

Apparently such treatment didn't sit too well with what is left of the Javelin organization. In a recent company newsletter, Javelin Chairman Robert L. Firmin argued that "misleading press reports unjustly hurt our image."

We uphold the right of the press to report layoffs, defections and sales problems, all of which occurred at Javelin. But Firmin does have a legitimate beef. One report quoted sources as saying that Javelin was preparing to file for bankruptcy, which the company was able to avoid by dramatically slashing its work force. No one expects Javelin to turn Lotus on its ear, but if a good product and a stubborn resolve are enough to succeed, then Javelin will do just fine.

Barney is *Computerworld's* senior editor, microcomputing.

Subsystem lets optical disks play on MS-DOS PCs

BY ALAN J. RYAN
CW STAFF

NEW YORK — A subsystem that reportedly makes erasable optical disk technology a plug-and-play peripheral on MS-DOS personal computers was recently announced by Advanced Graphic Applications, Inc. (AGA).

The subsystem was announced despite the fact that no erasable optical disk technology is currently available in volume. However, the manufacturer said that production quantities of its Discus subsystem will become available in the fourth quarter at about the same time erasable opti-

cal disks hit the streets. The company said it will license its Microsoft Corp. MS-DOS device driver technology to other vendors.

Several companies have announced plans to sell erasable media, including 3M Co., Sony Corporation of America and Tandy Corp.

Plugs into MS-DOS, OS/2

With AGA's Discus subsystem, optical disks can easily plug into machines running MS-DOS or Microsoft's OS/2, according to Matthew Katz, AGA's sales and marketing director. Discus is an acronym that stands for data, image, sound,

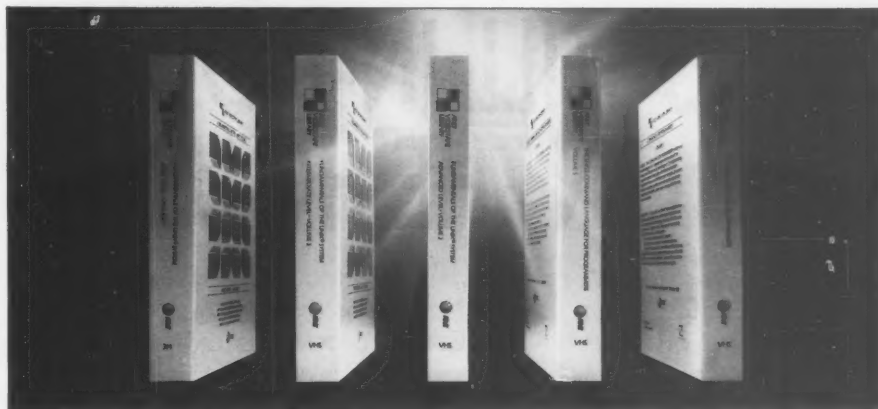
communication and unified storage, he added.

Discus is based on AGA's device driver software and reportedly enables PC users to store, retrieve, modify or delete data on erasable optical disks.

The AGA optical disk media is 5 1/4 in., as are other manufacturers' disks, and will therefore work in other manufacturers' drives, an AGA spokesman said. However, as with floppy disks, once a disk is initialized for the drive of a particular vendor, it will not work on other systems.

Discus is priced at \$4,995 and should be available in limited quantities in the fourth quarter, according to the vendor.

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NEW PRODUCTS

Systems

An interface between an Apple Computer, Inc. Macintosh-based desktop publishing system and a newspaper page-dumpling system has been jointly announced by **Quark, Inc.** and **Software Consulting Services**.

The interface is said to allow a Macintosh personal computer running QuarkXpress — which is a high-end desktop publishing system — to serve as a complete pagination system by importing page geometries and editorial copy from Software Consulting's Layout-8000 and

SCS-8000 systems, respectively.

Layout-8000 and SCS-8000 interfaced with Macintosh workstations will be available directly through Software Consulting in the third quarter of this year, the vendor said.

Pricing information has not been announced.

Software Consulting Services, 3162 Bath Pike, Nazareth, Pa. 18064. 215-837-8484.

Compu-tech Products, Inc. has announced a lifetime rechargeable backup battery for the IBM Personal Computer AT and compatible computers.

The **Bat Pac** is said to continuously charge while the system is on and will reliably back up clocks and setups for up to 12 months while the power is off. Charge time for a 12-month backup capacity is six hours, and a two-month charge requires one hour.

Bat Pac costs \$39.95.

Compu-tech Products, 720 Gardens of the Gods Road, Colorado Springs, Colo. 80907. 719-528-1800.

Software applications packages

Business owners, managers and human resource professionals can now create a comprehensive employee handbook tailored to the needs of any organization us-

ing the **Personnel Policy Expert** from **Knowledgepoint**, the vendor said.

The package reportedly relies on expert system technology to provide the user with the required knowledge base of human resource information. The program's question-and-answer format collects information that allows each policy to be customized to the user's requirements. A built-in word processor may be used to modify the handbook before printing.

An optional **Policy Maintenance Program** is offered by the vendor to provide the user with current labor laws and human resource practices.

The software runs on the IBM Personal Computer, PC XT, PC AT, Personal System/2 and compatible systems with a minimum of 384K bytes of random-access memory.

The **Personnel Policy Expert** costs \$495. The **Policy Maintenance Program** costs \$95 for a one-year subscription.

Knowledgepoint, 1311 Clegg St., Petaluma, Calif. 94952. 800-727-1133.

Software utilities

Realia, Inc. and **XDB Systems, Inc.** have announced an SQL Cobol preprocessor that they claimed will enable Realia Cobol applications to use XDB relational data base technology and the SQL language.

The **XDB SQL Cobol Preprocessor** was designed to permit embedded SQL commands within the Cobol code, thereby allowing applications programs to communicate with XDB's SQL Engine to access and modify data stored in XDB data bases.

XDB is compatible with IBM's DB2, and the **XDB SQL Cobol Preprocessor** costs \$395. It requires the XDB data base, which costs \$495, and Realia Cobol 3.0.

The **Realia Cobol** package includes a compiler, an editor and a debugger and allows large IBM VS Cobol programs to be developed and tested on an IBM Personal Computer, PC XT, AT, Personal System/2 or compatible system.

Realia, 10 S. Riverside Plaza, Chicago, Ill. 60606. 312-346-0642.

XDB Systems, Suite 220, 7309 Baltimore Ave., College Park, Md. 20740. 301-779-5486.

Development tools

A development tool for generating customized graphics applications on an IBM Personal Computer has been announced by **Meta Software Corp.**

Called **Design/OA**, the product is slated to ship this month. It was designed for use in both business and engineering environments.

The software uses a proprietary graphics and text-processing package, **Design 2.0**, to visually represent ideas and relationships.

The product's horizontal support environment is suited for developing simulations for the construction, manipulation and analysis of structured diagrams. For development purposes, an IBM Personal System/2 Model 70 or 80, a Compaq Computer Corp. Deskpro 386 or a close compatible with 3M bytes of random-access memory is required.

Design/OA costs \$7,500.

Meta Software, 150 Cambridge Park Drive, Cambridge, Mass. 02140. 617-576-6920.

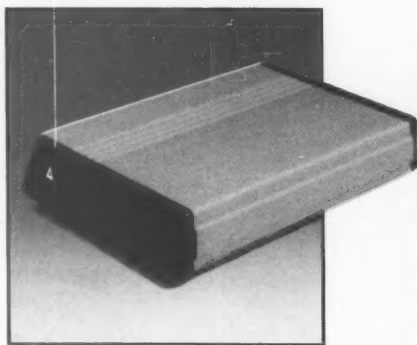
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NETWORKING

DATA STREAM

Elisabeth Horwitt

Waiting for a new ISDN



Think again, all you MIS and telecommunications managers who assumed that ISDN would eventually become the universal telecommunications standard — never mind how long it'd take. Your friendly neighborhood telephone company may have other plans.

It's not that the carriers are refusing to support Integrated Services Digital Network (ISDN) — *au contraire*, they are trumpeting their future ISDN compliance as proof of their sensitivity to users' needs. But push some of their spokesmen hard enough and you discover that while they fully intend to come out with services based on ISDN specifications, they are by no means committed to junking all of their existing proprietary enhanced services. We're talking coexistence, not migration, here.

Take Pacific Bell's Project Victoria, a technology that, like ISDN, allows users to send multiple voice or data transmissions over ordinary telephone wire. The carrier conceived of the offering not so much as an ISDN predecessor but as a lower cost ISDN alternative aimed at homes and small businesses that would rather not pay for special ISDN telephone sets and expensive ISDN boards for their personal computers. While the project has been put on indefinite

Continued on page 41

Where lies the future of APPN?

IBM's mid-range network may enfold more systems if SAA is in the cards

BY ELISABETH HORWITT
CW STAFF

IBM's Advanced Peer-to-Peer Networking (APPN), which currently provides distributed networking functions for IBM System/36s and Application System/400s, could emerge as a popular communications tool for other IBM systems and even non-IBM computers.

The question is whether those other systems will become full members of an APPN network, or end nodes that can communicate over an APPN network but lack full access to the protocol's unique features.

APPN is currently a proprietary network system with full functions only available to IBM System/36s and AS/400s. The vendor has yet to announce the networking protocol's inclusion in either Systems Network Architecture (SNA) or Systems Application Architecture (SAA).

On the other hand, APPN is based on PU2.1 and LU6.2 —

two peer-to-peer protocols that belong to both SNA and SAA. And it provides distributed networking functions to Distributed Data Networking, another IBM offering that recently achieved SAA status.

Status symbol

As a member of the SAA contingent, APPN would go into the public domain, making it easier for other computer vendors to implement the protocol on their own systems. Some 75 vendors are considering doing this, according to Edward Stevens, a support manager at New York-based software house Systems Strategies, Inc.

SAA status would also make it likely for APPN to migrate to other IBM systems — the 370 in particular. IBM spokesmen have admitted that traditional VTAM networks could use certain APPN features, such as the ability to automatically update tables of network resources.

In the interim, however, any

system supporting the PU2.1 protocol can participate in an APPN network — albeit in a limited fashion.

Hewlett-Packard Co., for example, has already announced intentions to support PU2.1 and is considering providing a PU2.1-based gateway to APPN, according to HP product line manager Michael Strickland. HP computers would be able to request data and send messages on an APPN network but could not have access to APPN features such as automatic updating of network resource directories.

Fuller support of APPN by HP would depend on "whether it gets integrated into SNA, how tight its integration is with Netview and whether it will be part of IBM's long-range strategy," Strickland said.

IBM's 370 also supports APPN in a limited fashion. The latest releases of VTAM and Network Control Program support PU2.1, enabling users on

Continued on page 41

Proteon seen eyeing faster nets

BY PATRICIA KEEFE
CW STAFF

WESTBORO, Mass. — Patrick Courtin, Proteon, Inc.'s new president, has put some weight behind rumors that the token-ring vendor is looking at a 500M bit/sec. network.

Generally speaking, there is increasing demand for greater bandwidth, he said during a recent conversation. The current token-ring standard of 4M bit/sec. is insufficient for the new class of personal computers, including IBM's Micro Channel-based Personal System/2, Sun Microsystems, Inc.'s Sun-4 and the increasingly popular Intel Corp. 80386-based computers, he said.

"These new PCs are starting to have tremendous need for bandwidth, and this pressure is

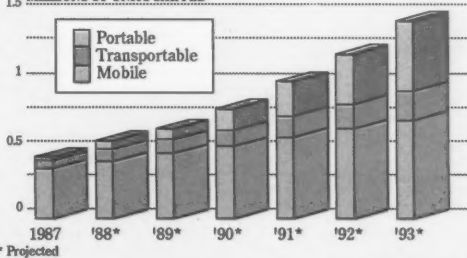
Continued on page 40

Data View

Cellular phones tap lucrative market

Improved technology, increased awareness and lower prices should help ring up shipments of almost 1.5 billion units by 1993

1.5 MILLIONS OF UNITS SHIPPED



INFORMATION PROVIDED BY VENTURE DEVELOPMENT CORP.
CW CHART

TCP/IP gate admits Cray

BY JAMES DALY
CW STAFF

MINNEAPOLIS — Computer Network Technology Corp. (CNT) recently announced a line of interprocessor gateway products said to enable Cray Research, Inc. supercomputers to participate as peers in a Transmission Control Protocol/Internet Protocol (TCP/IP) network environment.

The Lanlord Model 8023 — the first offering in CNT's Lan-

lord 8000 series — supports the TCP/IP suite available with Cray's Unicos operating system, CNT said.

The Model 8023 also supports 3M bit/sec. interconnection of IBM or Digital Equipment Corp. hardware linked to Ethernet networks, the company said.

Four Ethernet links can be connected directly to the I/O

Continued on page 40

Inside

- Quam announces PS/2 co-axial board. Page 44.
- Codex designs integrated net management system. Page 44.

Modems,
Multiplexers,
and Much More...



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Proteon

FROM PAGE 39

where [10M-bit] Ethernet is starting to show its age," he noted.

Out of steam?

Also key, "IBM wants to use the Token-Ring efficiently with its new AS/400 [mid-range computer]," and its 4M-bit offering will not cut the mustard, Courtin added.

Courtin conceded "there is a rumor somewhere" that IBM will deliver a 16M-bit Token-Ring hub, which he said will likely become a standard. Adding that Proteon, too, is in the standards business, he said "We will deliver the same as IBM."

IBM is expected to release a 16M-bit hub in November. A number of IBM customers have said they would welcome such a product, which would likely be used to tie a number of 4M-bit networks together.

Proteon currently has 10M- and 80M-bit token-ring networks, but only its 4M-bit network is IBM-compatible.

The 80M-bit network is used mostly as a backbone; however, it, too, is running into areas in which more throughput is required.

Too small for supers

As for future implementations of the Fiber Distributed Data Interface standard, on which 100M-bit token-rings will be based, Courtin said that even 100M bits is too small for networks tied to supercomputers from Cray Research, Inc., Ardent Computer Corp. or Stellar Computer, Inc.

However, he would not comment further on remarks from a Proteon investor that the company is looking at developing a 500M-bit network.

While very high-speed networks are hardly a high-volume business, Courtin said it nonetheless "is a nice business to be in." He noted business that use high-powered supercomputers are the ones who exhibit technical leadership.

Denies rumors

On another issue, Courtin did his best to deflate persistent rumors that Proteon is either shopping for a buyer or is a prime buy-out candidate.

"We do not need money, and we have not been approached by people. Our board of investors wants to go public," he insisted, declining to say when that might happen. "When the market improves," he joked.

Proteon has been talking about an initial public offering for at least a year.

Courtin did say Proteon was open to "the classic formula of seeking a credible alliance," such as was recently signed with Unisys Corp.

TCP/IP gate

FROM PAGE 39

channel on Cray supercomputers using the gateway, CNT added.

CNT spokesmen also said they consider the gateway an inexpensive way to link smaller systems to a Cray host. "Most solutions that exist today for

Ethernet on the Cray are very limited in the number of attachments they can actually make," the spokesman said. "We can improve dramatically on this connectivity."

The firm added that it hopes to release Lanlord versions that support the emerging Fiber Distributed Data Interface 100M-bit token-ring fiber-optic standard by the beginning of 1990.

The Lanlord Model 8023 configured to support two Ethernet networks to one Cray channel is priced at \$38,000. Support for two additional Ethernet networks is available for \$6,000.

The firm also announced the Lanlord 6000 series, which is said to allow users of Cray's station software — host-resident code that interfaces to the channel — to connect Cray super-

computers to IBM and DEC mainframes. The series also provides compatibility with existing Cray station applications and a migration path to the Lanlord 8000 series, CNT said.

The Lanlord 6000 series is available in a variety of configurations, starting at \$38,000. Both the Lanlord 8000 and 6000 series utilize CNT's 4000 series of remote bridges and gateways.

The next generation of desktop computing
will take us from being gatherers of data
to being cultivators of information.

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Horwitt

FROM PAGE 39

hold because of regulatory difficulties, the idea was to allow customers to choose, according to their needs, the best way to access Pacific Bell's services.

Nynex has a similar strategy in mind for its Pathway family of networking services as well as

the recently announced virtual private networking product.

The regional Bell holding company is committed to rolling out ISDN-based network offerings beginning in early 1989 but does not intend to replace existing network services with ISDN versions, explained Joseph Gustafson, Nynex's director of ISDN and Centrex product development.

Instead, Nynex promises to ensure that users of its existing proprietary services will be able to communicate with customers who choose the ISDN-based services. This is a tall order, Gustafson admitted, but it is the only way to protect its customers' existing equipment base — not to mention its own investment in central office technology to support Pathway.

This approach makes a lot of sense, considering that customers want enhanced services right now — not several years hence, when ISDN becomes a widely, if not universally, supported standard. Some vendors talk breezily of migrating their proprietary enhanced services to ISDN, but a more likely scenario is that the standard will become more widely installed

only as customers and carriers fully depreciate the equipment and software they now use for proprietary network offerings.

Nynex is letting its customers decide when and if they want an ISDN version of Pathway products, Gustafson said.

Help is on the way

For those of you who are patiently waiting for a rock-solid, unchanging, universally supported ISDN, don't hold your breath — but don't despair, either. Vendors like AT&T and Northern Telecom are working to ensure that their slightly different versions of an ISDN switch will communicate. Organizations such as the ISDN Users Group will be working with vendors toward a consistent set of early ISDN applications.

If the above projects bear fruit, users will be able to use a variety of networking services and equipment to access ISDN applications — without having to wait for vendors to agree on and implement a truly universal ISDN standard. That would be fortunate, considering that we may not have universal ISDN compliance for the next 10 years — or ever.

There is a strong possibility that ISDN, which only supports transmission speeds of up to 1M bit/sec., will be rapidly superseded by a higher speed standard that can support multi-megabit speeds required for graphics, real-time and video transmission as well as true local-area network interconnections. The bandwidth is available through the major carriers' fiber-optic networks.

What we need now is a new ISDN.

Horwitt is a *Computerworld* senior editor, networking.

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APPN

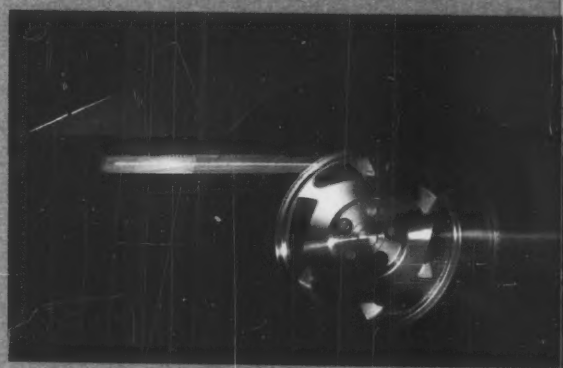
FROM PAGE 39

one APPN network to communicate over an SNA backbone to another APPN network. Any node supporting PU2.1 can access IBM 370 hosts through multiple APPN network nodes that pass through the transmission to the correct host. The System/36 or AS/400 communicating directly with the host must do so as a 3270 terminal and not as a peer, however.

These configurations, while useful, are still a long way from having 370s communicate with one another and with other types of computers on a full APPN net.

IBM spokesmen have conceded the need for APPN-like functions on its VTAM and SNA systems. However, it remains to be seen whether APPN will actually become the basis for IBM host networks. Some say APPN is only a prototype for the SAA networking system to come.

Digital
has
it
now.



In the past few years, Wilmar Inc., a member of the National Auto Parts Association, has enjoyed a substantial increase in productivity. Not to mention a growth rate that's twice the standard in the auto parts distribution and service industry. How do they do it? With a database tied to a computer network from Digital. One that allows Wilmar's three distribution centers and 150 stores to provide customers with fast, accurate and knowledgeable service.

As President Gary Davis explains, "We're a transaction processing-oriented organization. And in a service industry as competitive as ours, speed is everything. Nobody wants to wait. Whether it's for inventory information or for a part to be delivered. And with our system working in real-time, they really don't have to."

"Speed is one of the reasons we chose Digital's systems, as well as their proven reliability and uptime," Davis continues, "Because our computer is interactive, it has become the heart of the operational aspect of our business. It keeps track of everything. From over 2 million individual part



A computer network for transaction processing that's moving NAPA/Wilmar's growth rate and productivity into high gear.

numbers to 850,000 different prices. We even use it for forecasting and simulation. All of which helps us keep Wilmar customers coming back."

Davis also sees Digital's capabilities as a driving force in NAPA/Wilmar's future.

"With the VAX™ architecture, you can go up, down or sideways without needing to redo the programming. Right now, we're planning for our next phase of automation – computer cataloging. And after that? Well, there's no telling where we can go. But we're sure Digital will be there. With a level of service, responsiveness and commitment that's part of their whole package. A package that keeps NAPA/Wilmar moving in the right direction."

To find out more about how Digital can accelerate your business's success, write Digital Equipment Corporation, 200 Baker Avenue, West Concord, MA 01742. Or call your local Digital sales office.

digital™

NEW PRODUCTS

Local-area networking hardware

Quam Corp. recently announced a fiber-optic, Micro Channel-based Arcnet local-area network interface card.

The PS/2 coaxial board allows IBM's family of Personal System/2 computers to be used as file servers or workstations in Arcnet installations utilizing fiber-optic cable. The interface is primarily targeted at value-added resellers and systems integrators.

The product is software configurable and features on-board diagnostic LEDs to

aid in determining a system fault.

The PS/2 coaxial board costs \$495. Quam, 2817 Anthony Lane S., Minneapolis, Minn. 55418. 612-788-1099.

Local-area networking software

Net Line, Inc. is extending the original Comdex/Spring '88 discount price for its **Manylink for Netware** enhancement software package.

The product reportedly allows Novell, Inc. Netware users to share local printers and perform peer-to-peer file transfers.

Using **Manylink for Netware**, users

can add up to three local printers to each Netware workstation. The software is also said to incorporate locked directories to provide extra security for sensitive data.

Manylink for Netware will continue to carry a retail list price of \$495, a discount of \$200 from the original price.

Net Line, P.O. Box 3000, Provo, Utah 84603. 801-373-6000.

Network management

Codex Corp. has announced the **Codex 9330**, an integrated network management system that supports statistical, time-division and Codex multiplexers. The product is part of the **Codex 9300** series of personal computer-based network

management systems designed for small and medium-size networks.

The **Codex 9330** includes a Hewlett-Packard Co. Enhanced Series PC that incorporates a 12-MHz CPU, a 40M-byte internal disk and a 1.2M-byte diskette drive. The **Codex 9330** costs from \$16,000.

Codex, Maresfield Farm, 7 Blue Hill River Road, Canton, Mass. 02021. 617-364-2000.

Network services

Contel ASC and **Picturitel Corp.** have announced a standard turnkey videoconferencing package that includes videoconferencing equipment, dedicated transmission facilities with unlimited usage, installation, training and maintenance.

The package, available under a lease agreement, includes Picturitel's new C-3000 video coder/decoder. The coder/decoder reportedly operates at transmission speeds of 56K to 384K bit/sec. and is packaged in a compact console consisting of a color monitor and a camera.

The package costs \$10,700 per month for a complete turnkey network linking two locations.

Contel ASC, 1801 Research Blvd., Rockville, Md. 20850. 800-638-8514.

Modems/Multiplexers

A series of modem cards designed for IBM Personal System/2 models with the proprietary Micro Channel architecture have been announced by **Microgate, Inc.**

The **Synclink** modems support the PS/2 Models 50, 60 and 80 and offer synchronous micro-to-mainframe communications over ordinary telephone lines.

The modem cards are available in 2,400, 4.8K and 9.6K bit/sec. configurations. All models are field-upgradable to higher speed units. Communications software that includes IBM 3270 Systems Network Architecture emulation background file transfer is available for \$495. A 2780/3780 bisynchronous communications package with unattended background sessions costs \$395.

The **Synclink** modem cards cost from \$700.

Microgate, 9501 Capital of Texas Highway, Austin, Texas 78759. 512-345-7791.

Cabling

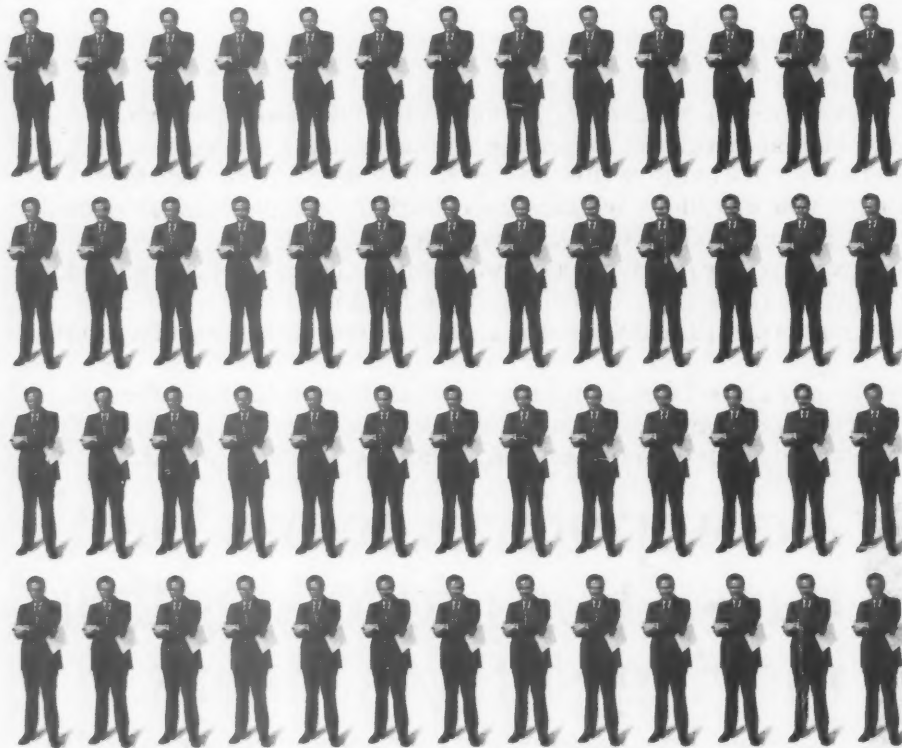
Belden Wire and Cable is now offering two 75-ohm cables for Manufacturing Automation Protocol (MAP) networks. Both cables reportedly meet IEEE 802.4 MAP requirements.

The **Belden 1223A** (RG-6/U type) was designed for broadband and carrierband drop applications from the cable trunk to individual workstations. Shield coverage is reportedly 78%, and the cable is 100% sweep-tested.

The **Belden 1224A** (RG-11/U type) can be used as either trunk cable for carrierband transmission or drop cable for broadband and carrierband signal transmission. Both cables are available in 1,000 ft put-ups.

The cost of the **Belden 1223A** is \$220.65; the **Belden 1224A** is priced at \$337.25.

Belden Wire and Cable, P.O. Box 1980, Richmond, Ind. 47375. 800-235-3364.



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When Northwestern Mutual Life's network goes down, it hardly goes unnoticed. In fact, with more than 2,000 home-office employees and nearly 7,000 field agents depending on the network for up-to-the-minute policy

information, it becomes an event of major proportions.

Which is exactly why **NET/MASTER**™ from Cincom® has become such a valuable asset to "The Quiet Company." "NET/MASTER has made life much easier from a network control point of view," explained Northwestern Mutual's Wayne Gajkowski. "It definitely keeps the network more available. For example, in one instance, it helped us eliminate a problem with NCP slowdown, which had caused considerable downtime—as much as two hours a week or more."

Driven by a powerful Network Control Language, **NET/MASTER** not only helps decrease downtime, it helps cut costs at Northwestern Mutual. As VTAM Specialist George MacDonald points out, the system's multiple sessions capabilities have allowed his company to delay hardware purchases and, in many cases, hardware upgrades as well as improve productivity. "I wouldn't want to have to manage a network like ours without something as high quality

as **NET/MASTER**," said MacDonald, whose company also utilizes **SUPRA**™ and **MANTIS**® from Cincom. "There's just no way in the world to do it."

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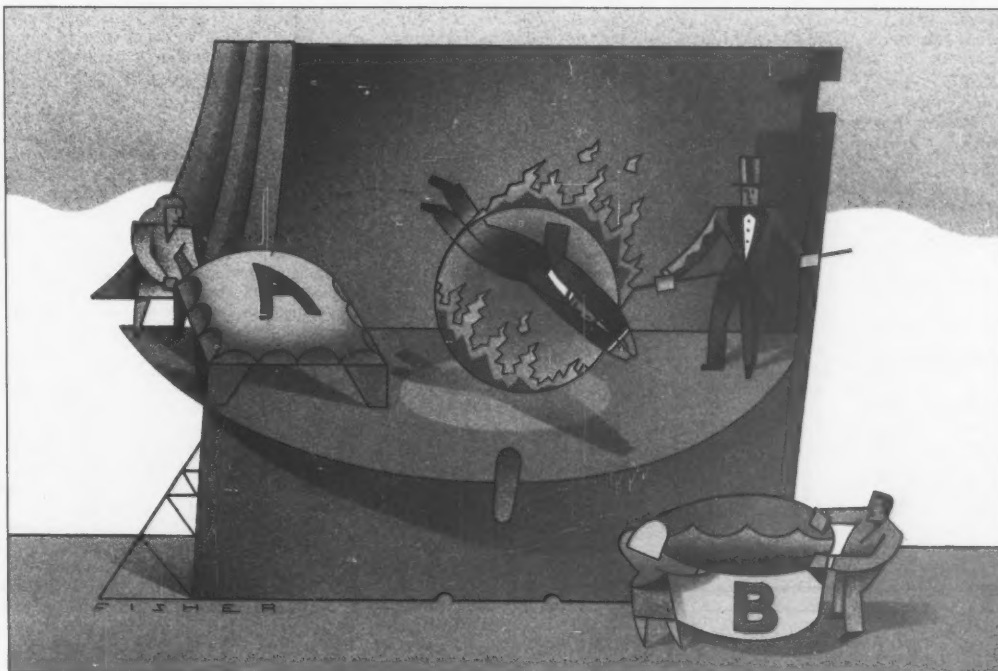
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In Canada, 1-800-387-5914

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PRODUCT SPOTLIGHT

PROGRAMMER PRODUCTIVITY TOOLS



Performance push requires special props

BY SHERYL KAY

Paul Feole knows what it is that slows up programmer performance and user requests stacked up in the wings. "Programmers spend too much time waiting," he says. "We wait for a program to compile, wait for a link to finish, wait for the cursor to reappear."

What's more, Feole, a programmer/analyst at ICI Americas, Inc., a pharmaceutical conglomerate located in Wilmington, Del., says he knows what is

Kay is a Tampa, Fla.-based free-lance writer.

needed to improve the pacing of development. "The more tools we get, the more we will accomplish, and the better we will do it," he says.

Many programmers are reaching the same conclusion these days. Feeling the pressure of the clock intensifying and sensing the eyes of the organiza-

tion upon them, programmers are looking hard for new ways to shave time and effort.

Conventional programming methods were sufficient to meet traditional requirements of management, programmers say, but now that organizations have tasted the real power of computing, the appetite for systems and

applications is almost impossible to satiate. To satisfy the demand, programmers need new and better props to improve performance.

What programmers are reaching for most frequently are program design and development tools, according to market research firm International Data Corp. (IDC), located in Framingham, Mass.,

According to a recent IDC study, "Application Tools, Markets and Trends," during the past few years these tools, which include optimizers, editors, debuggers, preprocessors, application generators and computer-aided software engineering (CASE) products, have outperformed the rest of the larger

INSIDE

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Restoration of The Hartford's code eases upkeep tasks. Page 56.

Performance

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scale systems tools market.

"The demand for tools that enhance the productivity of well-paid programmers and analysts without engendering significant modification in the MIS organization's behavior is strong," the report states.

At GTE Data Services, Inc. in Tampa, Fla., senior systems engineer Tim Pennel credits interactive testing facilities such as IBM's Test Facility and Application Development Systems, Inc.'s Xpedit, which he uses for testing assembler code, with helping him to quickly find where he is going off track.

These interactive testing tools flag each milestone within a program to let the user know immediately that the code is clean up to that point. When a mistake

is encountered, the program immediately informs the user.

"With tools like these," Pennel says, "I'm able to really narrow down where my error is. The times it's hardest to find an error is when you made the error yourself, and these tools will show you your own mistakes."

Playing hide and seek with errors is frustrating, but that process is smooth and painless compared with the exercise of moving from one programming environment to another.

The dreaded word

Conversion is one word most programmers dread. It means dealing with the tedium of examining each individual line of source code.

Denise Thomas, a senior systems programmer at Readers Digest Association, Inc. in Pleasantville, N.Y., and a veteran of several conversions, says she

felt that way until she encountered MHT Services, Inc.'s conversion aid MHtran-2 during her organization's current migration.

The company's ongoing project involves an OS Cobol to VS Cobol 2 conversion, with more than 300 programs in CICS. MHtran-2 goes through all statements and converts each line of code, changing those that are different and deleting the ones that do not exist in VS Cobol 2.

"Working manually, the move might have taken us a year," Thomas says. "Now, we will probably have it finished, including testing, within three weeks." The publishing company is seriously considering using Compuware Corp.'s Playback as a tool for testing system parameters to check the conversion's accuracy.

One of Thomas's favorite tools is IBM's ISPF. "It gives you a menu you can do your job from with just two keystrokes," she explains. "If I didn't have ISPF, I'd have to run everything vanilla TSO, and that [requires] one-line commands."

Searching for aids

Many programmers, however, are reaching for new tools well before either testing or conversion become issues. One kind of development aid that is gaining in popularity is the category of code generators. "Of course we can hard-code in assembler," says Brad Harris, a senior systems programmer at James River Corporation of Virginia, a paper company in Richmond, "but it's much more time-consuming. Why waste your time?"

Harris, who is one of 75 programmers at the company, works on an IBM 4381 running VM and uses Kolinar's Xmenu/E mainly for writing execs — quickie programs for limited use — for general-user purposes.

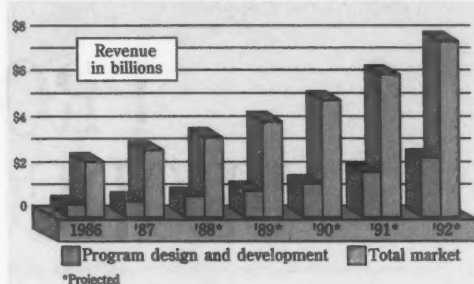
In one instance, he recalls, the development of a "Road Map" project — an easy-to-use program to lead new users through the system — required generating 50 to 60 different high-level panels, which certainly could have been done with hard code. By using Xmenu/E to generate the code, however, Harris was able to complete each coding task in several minutes vs. several hours. "It wasn't just easier and quicker," he says. "It gave us the ability to create a fancier, nicer looking system, too."

Senior programmer/analyst Ken Augustyniak at Marine Midland Bank NA in Buffalo, N.Y., is another proponent of code generators. Programming in Panosch Systems, Inc.'s Telon, a Cobol code generator, Augustyniak and his co-workers were able to respond ahead of schedule to a three-week deadline for coding 44 CICS programs.

If the group had had to use

Program design a hot ticket

With a projected annual growth rate of 32%, program design and development tools will be one of the fastest growing segments of the application tool market, outstripping total market growth by 10%



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP. CW CHART

conventional Cobol programming. "We would have worked a lot of overtime," Augustyniak says. "And we still might not have gotten it in on time."

Applications developers need these tools, Augustyniak says, to allow them more time to concentrate on analysis and design. "Sometimes these phases are really short-changed," he explains, "in order to get the code done on time."

In Belle Chasse, La., coding time is also being conserved at the Metropolitan Developmental Center, a state facility for the mentally retarded, through the use of a fourth-generation language. Although some may argue that fourth-generation languages are predominantly sold as user-friendly languages and not as productivity tools in the purest sense, Sue Daigrepoint, a programmer/analyst at the center, disagrees. She is using Unisys Corp.'s Linc fourth-generation language to develop a system that will allow the cen-

ter's personnel to plan 24-hour schedules for their clients as well as track clients' progress in the center's residential program.

"One program will do the entire users' data base — design data elements, paint screens, change screens and edit numerics," Daigrepoint says.

There are statements in Linc, just as there are in Cobol, but Daigrepoint says Linc is more straightforward and efficient. "It builds screens by packaging the screen with the data elements and logic associated with that screen and allows you to attach extra logic to that screen," she says.

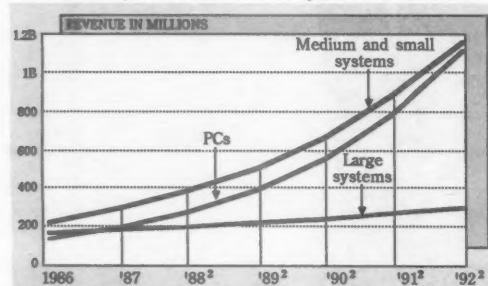
Chuck Hesselman, a programmer/analyst at Hussey Copper Ltd., a copper mining company in Leesdale, Pa., is also programming with Linc and has seen definite productivity improvements through the use of a fourth-generation language.

Hussey's three-programmer shop wears many hats in trying

Continued on page 48

Smaller systems set the pace for programmer productivity tools

Most revenue gains in design and development software¹ through 1991 will come from medium and small systems and PC sectors



¹ Includes application generators, computer-aided software engineering tools, preprocessors, optimizers, editors and debuggers

² Projected

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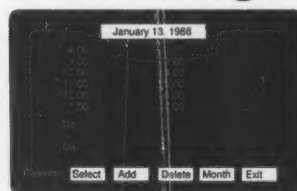
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It takes a good game plan to win savings with 4GLs

BY JOHN KOHLER



Fourth-generation languages play a major role in application development at Kimberly-Clark Corp.

To date, we have developed 35 systems implementing this technology, primarily with Applied Data Research, Inc.'s (ADR) Ideal. These systems have saved money and helped the company accomplish some strategic goals.

Using a fourth-generation language along with complementary tools and techniques to write these systems has helped increase their productivity.

Currently, all major projects are on schedule and under budget. Productivity has improved 300% over Cobol using only about 25% more resources.

Kimberly-Clark is a diversified corporation operating 25 companies in 19 countries around the world.

On the rise

In addition to consumer products, the company manufactures a variety of other goods, including health care, medical and fitness products. Kimberly-Clark is also in the airline, aircraft maintenance and transportation busi-

nesses. The company is growing steadily; sales increased from \$3.6 billion in 1984 to approximately \$5 billion in 1987.

On the systems side, the company has more than 100 ADR Datacom data bases and more than 12,000 Ideal programs.

Kimberly-Clark processes half a million transactions and 50 million data base requests per day in the U.S. alone. Approximately 250 MIS professionals are supporting this base in the U.S., and about an equal number are in position in the international market.

At any one time, between 160 and 170 of those employees are engaged in developing new systems. Right now, Kimberly-Clark is developing systems at the maximum rate that a corporation of our size can absorb.

Of course, fourth-generation languages are not the only tool in Kimberly-Clark's kit of development aids. Others that have been developed to complement Ideal and Datacom and are used regularly include a system flow prototyper, a data modeler, a specification writer and a process analyzer. The combination of these tools with a fourth-generation language have given us the productivity gains we were looking for.

The company also uses computer-aided software engineering (CASE) tools but only in pilot

projects. Based on those projects, we feel the gains to be made from the use of CASE products as they currently exist are primarily qualitative and insufficient to justify the training and expense involved.

Our kit of tools, including the fourth-generation language, has increased productivity much more than anything that we have done with CASE. CASE products are going to be important in the future, but they are not quite there today.

Our early experience with fourth-generation languages did not give us exactly what was expected either, but that was because some significant errors were made in preparing for their use. We had many of the right ingredients — but not the overall recipe.

Poor planning

Our first fundamental error was inadequate capacity planning, particularly for the systems that were to run in a distributed mode. We also did not train our staff adequately or sufficiently employ standards. We had programmers who did not have models to follow and analysts who could not keep up with the programmers; as a result, we started fast tracking projects.

All of this produced some early project overruns and much smaller gains in productivity than had been anticipated.

To fix the situation, we simply stood back, took a less technical view of what was being done and applied a normal business approach to the technology. It was only after setting our sights in this way that we realized what had to be done to accomplish the objectives of developing systems faster and with lower level people.

Using this business approach, Kimberly-Clark was able to analyze the reductions in development cost vs. the increases in operating cost for the systems using a fourth-generation language.

Hardware requirements are difficult to determine. First, a good systems plan is needed to start; then, a capacity plan that mirrors the requirements for that systems plan can be put in place. Capacity planning should be done far ahead of the time when a company actually gets into the design of major projects. Furthermore, the plan cannot be put in a book that sits on a shelf. It must be reviewed quarterly and updated annually.

Kimberly-Clark was able to

use capacity planning as a forcing device — a means for making us talk to each other internally and for making our project teams do better planning in terms of computer resources. The process has been refined to the point that our installation runs within 3% of our capacity plans on a month-to-month basis.

It was also at this point that we realized the importance of developing consistent systems throughout the corporation and began, with an almost religious

cur. Somebody loses whenever an organization tries to standardize and do things in a consistent way.

In addition, there are many staffing issues that are not pleasant to deal with. The ratio of analysts to programmers, for example, changes dramatically. Managing that kind of change is difficult, but the issues are ones that must be dealt with openly and up-front.

An additional aspect of the talent shift involved in this kind

of effort is the staffing of the development center. We feel that the concept of a development center to nurture data bases and develop technical expertise was one of the key underpinnings of Kimberly-Clark's recent successes.

The company also put in a quality management program to try to do things right the first time. That includes continual benchmarking of programmer productivity.

We periodically write and benchmark programs in two different environments and compare development time to make sure we are making the progress we think we should be. The program also includes ongoing tuning of data base performance.

Lower development costs and a more satisfied user base are achievable with productivity tools like fourth-generation languages and data bases, but realizing that return requires commitment to preinstallation planning and ongoing refinement. •

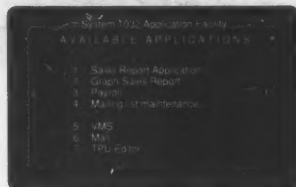
OUR KIT OF tools has increased productivity much more than anything that we have done with CASE. CASE products are going to be important in the future, but they are not quite there today.

effort, to institute a standardized development approach. In order to achieve consistency, we found it necessary to add some missing tools to the development process. We developed a standard model code system and productivity tools that we could use to create reusable code and techniques.

The benefits of that are off-the-shelf pretested code, a consistent development approach for both analysts and users, consistent development and architectural aids for our programmers, greater productivity and minimum training from project to project.

Organizational planning, as it relates to installation, is another critical step. Whenever a company implements change, a lot of second guessing is going to oc-

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Performance

FROM PAGE 46

to collect data from users and put a system together. An experienced Cobol programmer, Hesselman found his first experience with Linc to be a fruitful one — with it, he says he does not have to write a data base or cut screens, and his code writing time was cut by 80%.

"We're a small group here," Hesselman says, "and believe me, if we wrote in Cobol, we wouldn't have time for anything else, particularly systems design."

Beating the clock

The time savings offered by a fourth-generation language is also important to Gordon Griffith, director of corporate budget and financial planning at Montana Power Co. in Butte. Griffith, who provides technical support in an end-user department, is responsible for programming design and execution.

"Most programmers like to feel productive," he says. "I know I do, and you just don't feel that way if you're spending forever using tools that take too much time and prevent you from getting results for your company." Griffith is responsible for all financial modeling and data base tracking for cash management. His programming — for a variety of corporate applications ranging from portfolio management and income statements to strategic planning — is done in Information Resources, Inc.'s Express fourth-generation language product on a Prime Computer, Inc. 9955.

Recently, Griffith was called on to develop financial models to use in deciding whether to sell or lease a power plant Montana Power owns. Three times, new criteria was interjected into the set of questions to be answered, with deadlines of two weeks given at each instance for Griffith to arrive at the answer.

"Express allowed me to change things quickly — to build models and new logic sets," he explains. "What I did in three lines of Express would have tak-

en me 50 lines in other programming languages I've used."

Griffith is currently maintaining eight critical systems for Montana Power by himself. He credits this in part to programming in Express. "Take it away from me," he says, "and I might need to hire 10 programmers."

Relational data base management systems are not pure productivity tools. But the availabil-

ity of productivity tool modules within relational DBMSs make the data bases players in the productivity arena.

'Better alternative'

ICI's Feole says, "Programming in Ingres gives me a better alternative. With Cobol, I'd have to write the actual program, but with Ingres, I write an application of QBF frames with their

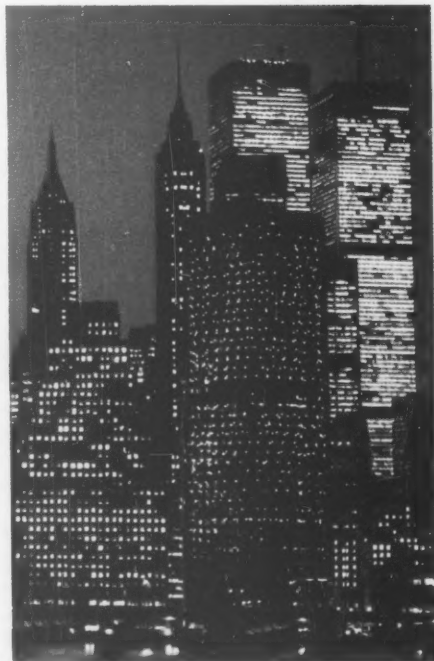
forms editor without ever writing a line of code." The Query-by-Forms, or QBF, subsystem found in Relational Technology, Inc.'s Ingres allows programmers to easily specify table and file names.

Feole says he recalls a time when he was given a short deadline to produce a prototype for a major research and development project. His group was trying to

convince management that they were the best ones for the project, so the prototype's outcome was critical. "With Ingres, we came up with the perfect deliverable prototype," he says. "We never could have developed it that fast with the few people we had without Ingres."

Today, Feole still relies heavily on Ingres's capabilities to save him energy. "Ingres puts

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it all together in a push-button mode," he says. "If you want to create a program, you start a subsystem, bring up a blank screen, tell it what data you want to go into it, and it's all done."

Relational data bases are not the only products that are expanding the definition of programmer productivity tools. Cooperative processing packages are another example of products

that, while serving other well-defined primary functions, are recognized by programmers as efficiency boosters.

At Compass Computer Services, Inc., a systems development house in Carrollton, Texas, programmer/analyst Tony Prim has had considerable experience with one cooperative processing package, Multisoft Corp.'s Superlink.

Superlink, an application development system for on-line transaction processing applications, offers peer-to-peer cooperative communications between mainframes and micros.

Prim, along with 10 other programmers, has been using Superlink on an Amdahl Corp. 580 to develop Compass's Answernet sales and marketing systems for hotel convention and

seminar planning.

While programming a recent application for sales people at Compass that would graphically display type vs. quantity comparisons, Prim experienced enormous time savings by using Superlink.

Instead of keying edits into a Cobol program and then compiling, he says, Superlink allows mainframe edits to be entered di-

rectly from the personal computer. "Normally, I would have had to code a bunch of looping routines in Cobol," Prim says. "Instead, I was able to do it with a one-line statement with a form definition and I could test it out right away on the PC."

Of course, there is a second side to every story and there are some negatives to the use of some of these tools. As Mike Dawson, also a senior systems engineer at GTE Data Services,

THESE tools don't eliminate the need for programmers. They eliminate the backlog that programmers are almost always faced with."

CHUCK HESSELMAN
HUSSEY COPPER LTD.

explains, "Any fourth-generation language or productivity tool works great if you work within the framework of its assumptions. Tools are great when they work, but watch out if they go awry."

With fourth-generation language code generators and similar tools, Dawson says there may be problems with reading dumps because these languages do not really compile. What should have saved time, therefore, can actually wind up taking longer and may ultimately be less accurate.

James River's Harris says some productivity tools such as fourth-generation languages and code generators make people much less productive because the packages are generating semiefficient code and sometimes cannot be debugged, especially by applications programmers.

Furthermore, programmers who have not used tools of these types are, in some cases, actively resistant to using them.

This is partly a reaction to what one programmer calls "the resume factor. When programmers look in the want ads, they see ads for Cobol/CICS programmers, so they think if the company brings in a code generator, they will lose their expertise and no longer be marketable."

Converts scoff at this concern, arguing that products such as fourth-generation languages enhance rather than diminish their positions. "These tools don't eliminate the need for programmers," Hussey's Hesselman says. "They eliminate the backlog that programmers are almost always faced with."

"Look at the trends," ICI's Feole says, noting that 10 years ago, programmers had many more types of opportunities than today. He predicts that the demand for programmers who

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have worked with code generators, fourth-generation languages and CASE products will increase greatly and that jobs will only change in the direction of increased responsibility.

Instead of three employees working on one project, each one would be able to take charge of an individual project.

"Taking on more projects," Feole says, "gives you the op-

portunity to rise to a management level and then create your own programming units." Once in management, he explains, an individual can use these same tools to nail down a programmer's alternatives.

The problem in the past, he adds, was not just the lack of tools but also a misunderstanding of what the programmer had to do to finish the task and how

long that would take.

"With many of these new tools, there are only so many ways a programmer can do something, and each way has a specific amount of time needed to accomplish it," Feole says. "So it's easier for the programmer because he only has to choose between maybe two ways of doing something. This is also better for the manager, be-

cause he knows how long each task will take, depending on the choice the programmer made."

The bottom line

Almost all programmers agree that in evaluating any productivity tool, management's ultimate concern will be dollar investment. Just how hard they look at this issue will, of course, depend on the type of tool being consid-

ered. For mainframes, those packages that are purely productivity tools, such as testing and debugging aids, may cost between \$10,000 and \$30,000. Fourth-generation language-based tools move into the \$100,000 range.

A large-system relational DBMS, which offers data base management and a fourth-generation language as well as productivity tools in one package, can cost more than \$200,000, with yearly maintenance fees in

WHAT we could really use is a tool that would allow a programmer to pop in and out of processing."

PAUL FEOLE
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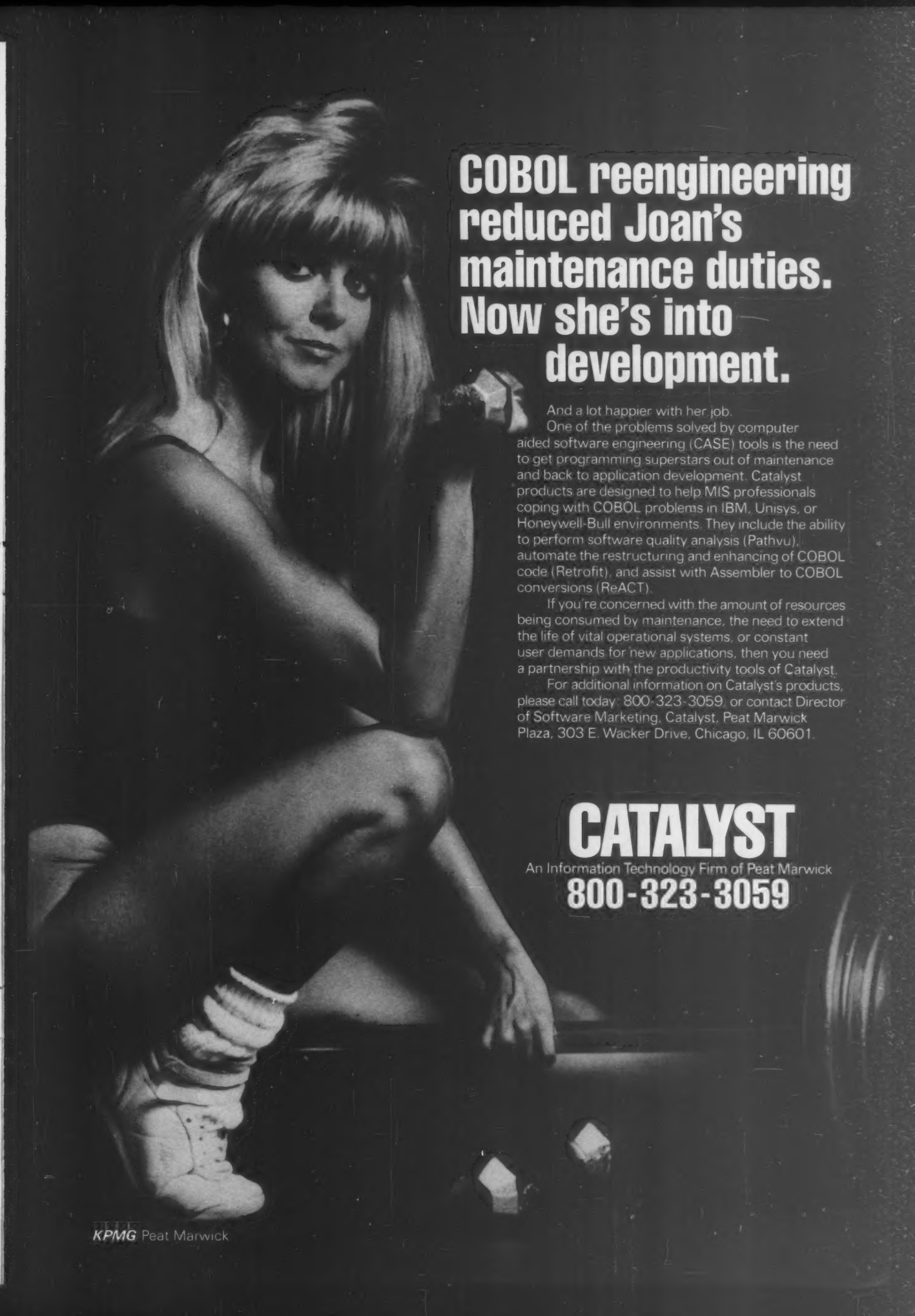
A convincing cost/benefit argument can be made, GTE Data Services' Pennel says, but it is important to choose your openings carefully. "Begin by focusing in on a programmer's need that is not being addressed currently or is being addressed improperly," he advises. Then document how much time the tool will save the programmer and how much more foolproof the system will be.

One thing that is certain is the fact that programmers can see several areas for improvement that have not even come close to being addressed yet. They are grateful for what is here but anxious for the next generation of improvements.

Metropolitan Development Center's Daigrepont goes back to better testing techniques for fourth-generation languages. "I'd love to have a package that creates endless streams of test data, because it's human nature to test with data that you think will work," she says.

A VTAM version of an interactive problem control system - a dump processor currently offered for VM - tops Harris's wish list. He would find great benefits from a tool that formats a VTAM trace entry into English. "A formatted dump is one thing," Harris says, "but this would tell you what each bit is and what it's doing."

At ICI, Feole sees the possibilities on a grand scale. "I'd like to have a combination of hardware and software that would allow me to do everything at once," he says. Programmers are constantly moving in and out of editors, for example, which Feole says could be greatly enhanced with a global tool for windowing. "What we could really use," he says, "is a tool that would allow a programmer to pop in and out of processing." •



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CICS without punishment

CICS, which ranks as the leading teleprocessing monitor in the IBM mainframe world, simplifies the sending, receiving and processing of information through on-line terminals. But, while CICS makes end users' lives easier by giving them greater access to on-line data, it also makes heavy demands on programmers in terms of coding, testing and quality control.

What makes CICS complex is not the amount of code that must be written. "If anything, a CICS programmer may execute less lines of code than a batch programmer because of certain macro generations," says Marty Southard, the CICS systems supervisor at GTE Data Services, Inc. in Tampa, Fla.

The difficulty of working in CICS comes primarily from the interactive nature of on-line programming. With on-line process-

ing, the programmer must be aware that there is a human who interfaces with that program in a conversational mode.

Acceleration of the testing

process is a particular concern when either a major development or conversion project is undertaken. That was the case a few years ago at Motorist Insurance Companies in Columbus, Ohio, when the organization converted its personal auto in-

urance lines from macro-level CICS, ISAM, to command-level CICS, with IBM's IMS data base management system and VSAM files.

"During our programming phases, we used Intertest for both positive and negative testing," explains Sharon Estepp, senior development center consultant at Motorist Insurance. "Intertest gave us the ability to

dynamically manipulate the value of the field within the CICS core and working storage." Without Intertest, Estepp says it would have been nearly impossible to test all of the modules, especially for negative testing, which is more logically demanding, and still bring the project in on time.

At Central Vermont Public Service Corp. in Rutland, in-

Three out
of four
programming
hours are
wasted.



GTE's Miley

ing, the programmer must be aware that there is a human who interfaces with that program in a conversational mode.

"Response time is more critical than in batch, so the complexity is in the execution of the program," Southard says.

Help wanted

Because CICS is such an unforgiving environment, data processing managers of CICS shops are always on the lookout for suitable programmer productivity aids.

"I need tools for my people that will eliminate those steps of processing that are redundant or time-consuming in a CICS environment," says Tim Miley, systems manager for three support groups at GTE Data Services, including Southard's CICS team.

Southard's team is responsible for supporting systems in 10 GTE telephone companies, where processing varies depending on account size. Some of the larger GTE systems are responsible for an average of 500,000 CICS transactions a day, with the acceptable response time set at less than five seconds.

A couple of tools that the CICS group uses to help maintain acceptable response time at this level of activity are Intertest, a test and debugging tool

UN

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creasing productivity in the testing and debugging of CICS is a concern.

Meg Grove, systems programming manager, says she has seen a substantial difference in the speed with which her 25-member group resolves problems since bringing in Computer Associates International, Inc.'s CA-Eztest/CICS.

"The storage areas are more

scattered in CICS, so it is more difficult to debug," Grove says. Using Eztest enables programmers to look at specific storage areas by name instead of having to know exactly where they are.

According to CICS programmers, in order to qualify as a CICS productivity aid, a tool must offer increased speed and accuracy in one or more tasks specific to CICS vs. batch pro-

gramming or that are more demanding in the CICS environment. These include mapping, or formatting, incoming/outgoing terminal screen messages; checking of individual CICS EXEC commands; reading files; accessing data; or manipulating data fields.

Miley's group at GTE Data Services is currently conducting cost/benefit studies on several

tools. "We quantify what a tool will cost us and what it will save us, and then we look at any other benefits the tool might bring us," he says. From there, an evaluation team is formed from the members of the CICS team, and the product is brought in to be tested. Tools Miley is currently looking at include computer-aided software engineering (CASE) tools, testing tools to

evaluate high-volume stress situations and a program analyzing tool, Viasoft, Inc.'s Via/Insight.

Miley admits that once the purchase is made, however, measuring the increase in CICS programming productivity may not be 100% accurate. "The industry standard is to look at lines of saved code," he explains, "but there are other product and people benefits you have to look at."

To solidify his assessment of a CICS productivity tool, he looks for either a shorter turnaround time in response to a problem or

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a shorter development cycle.

CICS testing, however, is not the only area that could benefit from the use of productivity tools. "We've gotten some exposure to CASE tools," Miley says. If the industry goes with code generators "that can take CICS from requirements right through to production," Miley says he will give serious consideration to such productivity aids as well.

Currently, Miley's major problem is that his CICS group faces a conversion of more than 700 CICS macro-level programs — all programs written in assembler — to command-level CICS. He says several tools are available for conversion of macro-level programs written in Cobol or PL/I, but nothing comparable exists for programs written in assembler. "If I could only find one out there," Miley says, "we wouldn't need someone to go through each program and make all of the logic changes."

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Keeping pace on projects

BY WILLIAM FISCHER



Creation and maintenance of software development schedules is difficult. Inaccurate estimates at the beginning of a development project often result in unrealistic projections for completion dates and chronically faulty task schedules. When task

Fischer is a project manager at Hewlett-Packard Co.'s Logic Systems Division in Colorado Springs.

schedules are based on a flawed calculation to begin with, they must be constantly changed and adjusted as the project progresses.

The effort required to manage changing task schedules with general-purpose scheduling and tracking tools can be daunting. However, ongoing schedule management is essential to successful project completion and to effective planning in other areas of the organization, so some workable method must be found.

Hewlett-Packard Co.'s Logic System Division has chosen a standard data base package for project scheduling and tracking as an alternative to commercial tools that make use of traditional scheduling methods such as Program Evaluation and Review Technique, or PERT, and Critical Path Method, or CPM.

These general-purpose scheduling and tracking tools are excellent at managing projects where the tasks are well understood at the beginning. Task dependencies — rigid relationships that have one task starting only after another is completed — are managed well with these tools.

These tools do a poor job of managing software design projects, however, because they lack the flexibility needed to

make quick changes and to massively adjust individual task estimates based on project experience. When a company uses a scheduling tool based on PERT or CPM, for example, changes in the order of task performance can create problems.

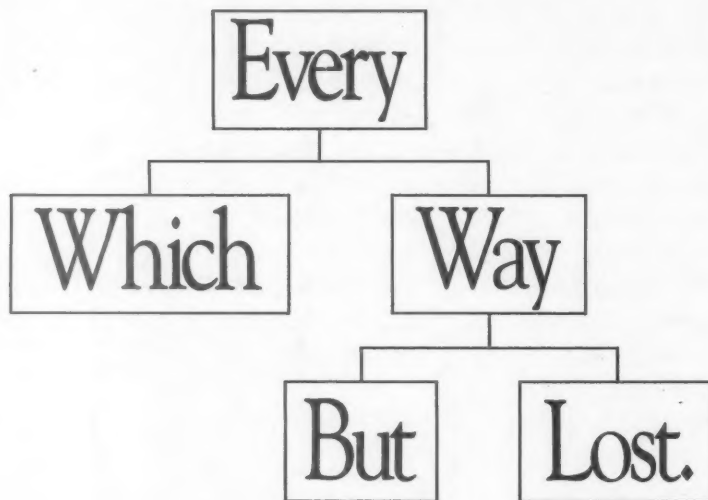
When building a house, there is a compelling reason for completing the walls before beginning the roof.

In system design, however, there is usually no reason — aside from the constraints imposed by scheduling software — to address modules in a particular order. If an employee designs a portion of a module and realizes that he needs information from a colleague who is out of the office until next week, it is perfectly acceptable to make use of the interval by starting the design of the next module.

Another common problem with existing scheduling products is their static nature. After-the-fact alterations of estimates as a result of new information are extremely time-consuming. For example, if completed tasks have taken an average

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ONGOING schedule management is essential to successful project completion and to effective planning in other areas of the organization.

of 50% longer than the planned time, it is not possible to make a global change for remaining tasks. Instead, traditional methods force managers to change the time estimates for each of what may be hundreds of individual tasks. Rather than repeat this process every time a variable changes, most software development managers do nothing and allow schedules to fall further and further out of touch with the reality of the project.

When project schedules are not changed and updated to reflect the actual process as it unfolds, unrealistic expectations are created in other parts of the organization, deadlines are missed and projects collide unnecessarily. Worst of all, there is no feedback to improve the management of the scheduling process.

In search of flexibility

In the search for more flexible scheduling tools, we tried working with task lists generated by text editors, eventually progressed to spreadsheets and then discovered that data bases offered the kind of flexibility we were looking for. Data bases can easily be set up to handle scheduling in the way we said is necessary to manage software projects properly.

Most data base tools contain data entry facilities that can be easily customized for handling project scheduling. Tasks can be entered as records in the data base, with fields for task title, description and group; assigned designer; priority; status; original and current task estimates; the number of workdays remaining to complete the task; and the completion date.

Additional fields can be created within the task record to organize information such as the project phase of the task, whether it belongs to the specification, coding or test phases. This additional information aids metric collection and improves management feedback.

Data bases permit total flexibility in report generation. Task lists can be generated through data base sorts performed

by the report generator on the various fields. Cumulative totals of time remaining in all task groups can also be printed.

The order within the task group is also discretionary. We discovered that sorting the task group by current status, rather than predetermined priority, makes more sense in the context of software development because, as mentioned earlier, priorities are seldom rigid requirements. Completed tasks are displayed first, followed by those that have been started and those that are left to do. Dependencies exist between tasks only when required. If an optional priority was entered, then tasks will be sorted by priority within task groups of the same status.

Nice and easy

This simple method has many advantages. For one thing, the fact that tasks assigned to a designer end up on a task page in a logical grouping means that individuals can manage their work more effectively. Furthermore, the process of task reassignment is simplified. Using traditional tools, reassigning task responsibility requires breaking and remaking several task dependencies, and failure to properly perform the operation results in a jumbled schedule output. When a data base is used, all that is required is a change in the assigned designer field.

Intermediate and final project completion dates can be arrived at from summary reports of the days remaining for each software designer on the team by using the date calculation feature included in most data base packages.

The advantages of using a data base for scheduling are readily apparent when trying to achieve greater scheduling accuracy. Project management experience has shown that schedules tend to grow incrementally during the length of a project. This growth results from three factors: tasks that take longer than originally anticipated, additional tasks that are added to the schedule and tasks that take longer for no apparent reason.

Data about a project's progress is easily acquired during progress meetings. Using a data base, it is possible to perform dynamic calculations to produce an accurate and up-to-date growth factor for the schedule.

A schedule growth factor is calculated by dividing the number of days added to the schedule — because of the three factors mentioned above — by the total days worked. The factor applies not only to the remaining days on the schedule but also to the additional time that will be added to the schedule in the future. This indicates that the actual growth of the schedule is modeled by a power series expansion of the growth factor. The following table indicates how standard growth factors translate into corrected growth factors:

Standard Growth Factor	Corrected Growth Factor
1.0	growth factor
1.1	1.11
1.2	1.25
1.3	1.43
1.4	1.67
1.5	2.00
1.6	2.45
1.7	3.33
1.8	5.00
1.9	10.00
2.0	schedule is unstable

The corrected growth factor yields information about the quality of project

WHEN PROJECT schedules are not changed and updated to reflect the actual process as it unfolds, unrealistic expectations are created and deadlines are missed.

schedules. Schedules with growth factors of 2.0 and above do not converge, which means the schedule is never finished.

This is best illustrated by a schedule in which working 10 days adds another 10 days to the schedule. An employee would never finish because the schedule always remains its original length. Schedules with growth factors nearing 2.0 show little confidence. Those with growth factors

of 1.5 and below can probably be trusted. The flexibility of data bases allows task estimates to be adjusted. This information can also be used to improve the scheduling process.

From the project completion date generated from the data base, graphs of the changes in schedule estimates can be created to track the history of the project. Such historical graphs provide visible

feedback on the quality of the estimates made during the course of the project.

Tom DeMarco, creator of the DeMarco methodology for software design, has said that software development projects fail as a result of both sociological and technological factors. These factors include poor project team communication and morale as well as technical difficulties inherent in certain software tasks.

Careful monitoring of schedules helps pinpoint these project problems while there is still time to take corrective action. Data bases are flexible enough as scheduling tools to permit easy schedule updates, based on actual project history. This provides the project manager with timely, accurate information so that mid-course project corrections are possible. ♦



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Creating foundation of easy-care code

BY WILLIAM CUTLER



The Hartford's insurance group is now in its fourth decade of automation. The automation investments made during that time, particularly in real-time systems developed during the past 20 years, form the backbone of the automation that services our customers today.

Although we continue to seek new ways to use automation for competitive

advantage, the development investment for these bread-and-butter systems is, for the most part, past. The current major automation expense for most companies is maintaining the code that is already developed.

Approximately 70% of The Hartford insurance group's information management personnel resources are devoted to maintenance of existing systems. Our inventory of production Cobol code exceeds 34,000 modules, comprising 24 million

lines of code housed in production libraries.

The condition of the code we maintain ranges from highly structured to highly unstructured. Changes made to the code in order to accommodate new insurance regulations and business strategies have increased its complexity and reduced its structure over time.

Four years ago, we started looking at the problem of maintenance and what we could do to make that area of program-

ming more efficient. The goal was to avoid the large increase in staff that was inevitable if maintenance was allowed to proceed along its current path.

As the maintenance problem was studied, it became apparent to company officials that several processes clearly needed to be put in place to methodically attack the problem of maintenance and its increasing cost.

Management structure

Our first step was to introduce a process to allow managers and programmers to manage maintenance change more productively; we called this step preservation. The idea was to prevent further degradation of the code as a result of normal maintenance changes.

As part of this process, we developed a software analyzer to rate the code's condition and understand what the maintainability of that code is based on a score of 1

CODE CHANGED in maintenance must score as well or better after a change as it did before, otherwise it is not allowed into production.

to 100.

We cataloged scores of all the code in production and put it in divisional libraries. We then introduced a procedure for evaluation of code after changes were made and set management rules relating to the score of the revised code.

One rule is that code changed in maintenance must score as well or better after a change as it did before, otherwise it is not allowed into production. Other rules, formulated at the same time, relate to minimum standards on new code. This process established a base line measurement for our existing code as well as a management process that would allow changes to code without degradation.

Reducing complexity

Because we believed restructuring code to a common and consistent structure was absolutely necessary for easing the burdensome task of code maintenance, the next phase in the overall plan for maintenance was to select a code restructuring tool.

Once a product was located and put in use — Recoder from Language Technology, Inc. — we found that the analysis performed on the newly structured code resulted in few options for administering change.

In analyzing a similar change to the code prior to its restructuring, a multitude of options could be exercised in trying to change that code's functionality during a normal maintenance process. Reducing the options for change eliminates the "trial and error" aspect of change maintenance. This, in turn, reduces the number of tests performed and amount of time spent.

Simplifying code through restructuring also eliminates the danger of unforeseen inaccuracies in changes because of complex code structure.

Restructuring all of our 34,000

Cutler is secretary and director of personal insurance lines in the automobile division at The Hartford's insurance group in Hartford, Conn.



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modules of existing code is a long-term goal. Current plans call for the re-engineering of approximately 13,000 modules during the next two years. The modules targeted for this first-stage effort are ones that are subject to frequent changes and are among the most difficult modules to maintain.

Restructuring is the key to our long-term maintenance process, and several benefits emerge from this process.

Restructuring will give consistency to our code. The process will guarantee a common format, simplified expressions, reduced complexity and common documentation.

Restructuring also reduces the complexities of the code to a minimum. This will make the code easier to interpret and, most important, easier to alter in the future.

Building on CASE

While the restructuring phase is still in progress, we are also deploying other types of tools that fall within the broad category of computer-aided software engineering (CASE) to ease the burden of maintenance.

These tools, which are a combination of commercially and internally developed products, address such key areas as testing improvement, automation of analysis, reduction of repetitive maintenance processes and code splitting.

Our strategy is to use them in conjunction with the restructuring process wherever possible. The application areas generally restructure their code first and then apply these additional automation aids to the maintenance process.

A major emphasis is also being placed on improving test facilities through the use of new tools such as test-path analyzers, test-case generators and interactive testing tools. These products, obtained from a wide variety of vendors, are being integrated on workstations to improve ease of use.

We have also introduced automated analysis through the use of cross-reference software products such as LIB XREF, which identify modules that may be impacted by such planned changes as data element changes.

This kind of view into the relationships between modules provides a measure of planning accuracy that is impossible for analysts to achieve with only code listings.

It is hoped that this improvement, in conjunction with our migration to workstation-based software maintenance tool kits, will assist in higher productivity in the process.

Work flow scenarios are being developed to assist in automating processes that are repetitive in the maintenance world. These processes are designed to add rigor to our maintenance and ensure that consistency and accuracy are maintained when changes are being made to modules.

And finally, processes and tools are being developed to assist in the task of splitting large, complex and frequently altered modules into smaller modules with isolated functions.

Knowledge base

Use of these new tools and techniques in conjunction with the overall process of restructuring will assist us in reaching our goal of a common base of maintainable code. It will take several years to achieve this objective, but it is already clear that

RESTRUCTURING REDUCES the complexities of the code to a minimum. This will make the code easier to interpret and, most important, easier to alter in the future.

the exercise will allow us to reduce the number of people necessary for the maintenance function.

The next step is to establish a knowledge base for our applications that would serve as the basis for reverse engineering of existing code.

The Hartford has been in contact with several CASE vendors and is very interested in what is being developed in the

marketplace that would assist us in capturing the essence of a business application. Design abstractions of the structured system must be captured in order to provide us with the ability to automatically generate new code from the essence of old.

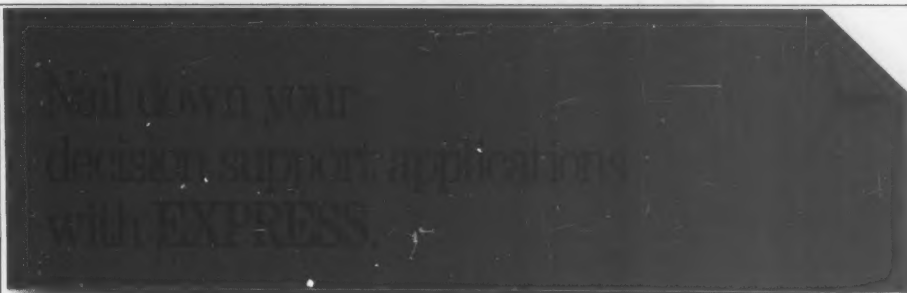
We would like to build a bank of information about the functionality and characteristics of applications from which we

could interface to the code generator of our choice.

A lot of work needs to be done in this area before it will be possible to interface our existing code to a code generator through the agency of reverse engineering.

A more automated solution than now exists is needed. In all likelihood, one will soon emerge and, in the meantime, establishing a consistent base of restructured code puts us in a position to capitalize on that solution when it does emerge.

Technology is coming together to support the field of software maintenance. Adding rigor to current maintenance processes and restructuring our current base of code will serve as stepping stones to the future. •



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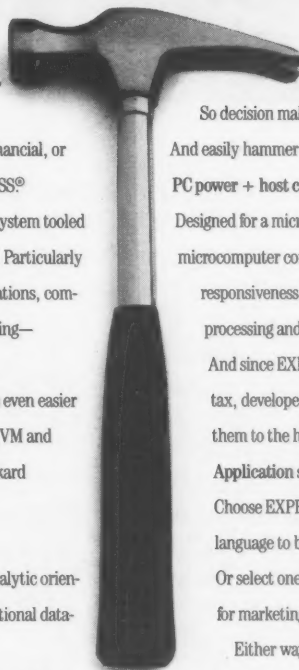
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ASK THE VENDOR

The following questions were solicited from users and conveyed to the vendors for responses.



Does Cincom intend to integrate preliminary system design documentation into Mantle for complete product specifications? Will the company provide graphics capability to display these system specifications?

*Roger Woll
Data Base Administrator
Broward County
Fort Lauderdale, Fla.*

CINCOM SYSTEMS, INC.: Yes. To address the design phase of the application, Cincom has formed an alliance with Index Technology Corp. and D. Appleton Co. Index Technology's Excelerator and D. Appleton's Personal IDEF/Leverage can be used to create graphic design documentation.

The design specifications created with these computer-aided software engineering tools is integrated with the application development system Mantle, the relational data base system Supra and the text management system Mantext.

We have made a heavy investment in applications developed using the VSAM version of McCormack & Dodge's SDT. Now that we're looking at IBM's DB2 and Millennium:SDT/DB2, will we have to throw out what we have and start all over again?

*Alan Sohn
Business Systems Consultant
Prodigy Services Co.
White Plains, N.Y.*

MCCORMACK & DODGE CORP.: No. Millennium:SDT/DB2 allows concurrent access to both VSAM and DB2. Users can migrate applications to DB2 by simply redefining the VSAM files as DB2 tables or views.

Millennium:SDT components, including Millennium:PDL, M&D's fourth-generation language, remain untouched. SQL can be used to augment Millennium:PDL, which is a host language for SQL similar to Cobol.

We are a service bureau providing patent-related services to corporate legal departments and law firms using an IBM 9370 Model 40 with DOS/VSE and CICS. Other than upgrading to a larger CPU and/or going to MVS, either of which would be very costly, how can we improve performance and functionality?

*Gary Schneider
Master Data Center
Southfield, Mich.*

UNICORN SYSTEMS CO.: Use Unicorn's VM/CICS/ES and VMSAM and run CICS/VSAM under native VM. In addition to performance and functionality improvements, VM provides separate virtual machines for multiple users of each client — private client data bases — ideal for a service bureau or anyone requiring a high level of security. The system will also be much easier to use and maintain since IBM's DOS/VSE, VSAM and CICS are no longer needed. In fact, a user's overall costs will most likely be less.

I find the options on CA's product,

CA/Optimizer, to be excessive, and this makes the process of tailoring the product for our production environment confusing. Will CA ever reduce the number of these options? Will the DCSL option ever be made dynamic so we can turn it on for testing and off for production?

*David Stern
Manager of Technical
Support
Banc Boston
Jacksonville, Fla.*

COMPUTER ASSOCIATES INTERNATIONAL, INC. CA ships CA/Optimizer with preconfigured defaults that conform to the requirements of most data centers. The options, by definition, can be invoked and altered to meet the special needs of a user or organization. In fact, new defaults may be set according to shop standards, removing a customer's need to use any options.

With regard to the DCSL question, our support personnel will provide users with the proper combination of options to allow the detector portion of the product to be turned on for testing and off for production.

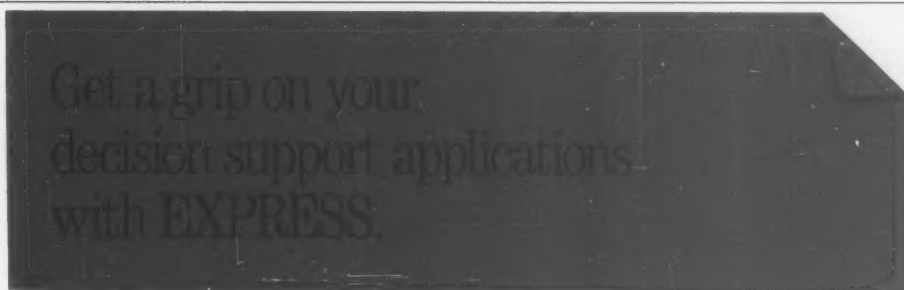
The next release of the product will eliminate the need for several options, including DCSL. It will also include an on-

line Help facility that provides a description of each option and allows for easy tailoring.

When will the new menu-driven version of Henco's product, Info, be available to run on Prime Computer, Inc. computers?

*Doug Bassett
Vice-President
Chase Manhattan Corp.
New York*

HENCO SOFTWARE, INC.: Henco has no plans to introduce a menu-driven version of Info. However, using Info's fourth-generation language, a menu-driven system can easily be developed that will allow all facets of Info to be accessed through the menu. ■



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Fourth-generation languages

COMPANY	PRODUCT	HARDWARE PLATFORM	DIRECT PORTABILITY TO WHAT OPERATING ENVIRONMENTS	SUPPORTS COOPERATIVE PROCESSING	TYPICAL USER	INTEGRATED WITH DBMS	INTEGRATED WITH DATA DICTIONARY	INTEGRATED WITH APPLICATION GENERATOR	INTERPRETIVE/COMPILED LANGUAGE	AUTOMATIC SYNTAX CHECKING	USES MENUS/PROMPTS	USES WINDOWING FOR DEVELOPMENT	INCORPORATES WINDOWS IN CREATED APPLICATIONS	SUPPORTS SQL	PRICE
Adron, Inc. (617) 335-3333	Guest-IDT	IBM mainframes	MVS, VSE, VM/CMS	No	Programmer	No	No	No	Compiled	Yes	Menus	No	No	ANSI standard (late this year)	\$19,500-\$59,000
Applied Data Research, Inc. (301) 874-9000	Ideal	IBM 370 architecture, PCMs ²	Between all operating environments supported	Yes	Programmer	Datacom/DB, DB2	Yes	NA	Compiled	Yes	Both	Yes	No	DB2	\$73,200-\$175,000
Apscore International, Inc. (363) 295-6969	Can-Bic	Independent	Unix, VM, MVS, DOS, VMS via Pick	Yes	Programmer	Pick	Yes	Yes	Both	Yes	Both	Yes	Yes	No	\$300+
Business Computer Solutions, Inc. (800) 234-3687	Zfour	Any running Unix, Xenix, DOS, VMS	Between all operating environments supported	Yes	Programmer	Zfour	Yes	Yes	Compiled	Yes	None	Yes	Yes	ANSI	\$1,295-\$50,000
Carlston Corp. (617) 272-4310	CQS-INFOTEC	IBM 9370; 4300 series; 3000; 370; IBM PCs	Honeywell	Yes	Both	IMS/DLI, IDMS/R, Datacom/DB, Adabas, Total/Supra, DB2	Yes	Yes	Compiled	Yes	Both	No	No	ANSI	\$19,000
Certified Software Specialists (403) 998-0607	ACT/I	IBM mainframe	MVS/XA, ESA, MVS/SP, OS/VS1, VM/SP, VM/XA, VSE/SP, DOS/VSE, SSX/VSE	No	End user	No	No	Yes	Table driven	Yes	Both	No	Yes	NA	\$15,000-\$40,000
Cincom Systems, Inc. (513) 662-2300	Mantis	IBM MVS, DOS/VSE, VM/CMS, VSE, PC-DOS, OS/2; DEC VMS; Wang VS; NCR VAX/MCS; VAX/Transgo III; Siemens POS 2000; ICL TPMS, TFS	Between all operating environments supported	Yes	Programmer	Total, Supra, DB2, IMS, D4, IDMS, IDMS/R, Adabas	Yes	Yes	Interpretive	Yes	Both	Yes	Yes	ANSI	\$6,000-\$190,000
Cognos Corp. (800) 426-4667	Powerhouse	VAX; DG Eclipse/MV; HP 3000; IBM PC AT or compatibles	Between all operating environments supported	Yes	Programmer	RDB/VMS, RMS, Info, DC/SQL, Turboimage, KSAM	Yes	Yes	Compiled	Yes	Both	No	Yes	NA	NP
Computerwise Data Technologies (617) 661-8448	System 1032 4GL/DBMS	VAX	None	No	Programmer	System 1032	Yes	Yes	Compiled	Yes	Both	No	Yes	No	\$3,000-\$180,000
Computer Corporation of America (617) 492-8860	User Language	IBM 370 architecture, PCMs	MVS, MVS/XA, VM/CMS, DOS/VSE	Yes	Programmer, end user	Model 204	Yes	Yes	Interpretive	Yes	Both	No	No	No	\$10,000-\$100,000
Computer Techniques, Inc. (717) 586-1030, ext. 350	QUEO-V	IBM PCs or compatibles; Prime; DG	Between all operating environments supported	Yes	Programmer, end user	QUEO-V	Yes	Yes	Compiled	Yes	Both	Yes	Yes	No	Starts at \$495
Concept Omega Corp./Thoroughbred division (800) 542-0430	Thoroughbred IDOL-IV	AT&T 3B series; 80386 supermicros; HP 9000 series; IBM PS/2 Models 50, 60, 80; 68020-based minis	Unix, Xenix, DOS, Thoroughbred/OS	Yes	Programmer	Thoroughbred IDCL-IV DBMS ³	Yes	Yes	Compiled	Yes	Both	Yes	Yes	No	NP
CRI, Inc. (408) 880-8888	Grail	HP 3000	None	No	End user, programmer	Relate	Yes	Yes	Interpretive	Yes	Both	No	No	No	\$2,500-\$25,000
Cullinet Software, Inc. (617) 329-7700	ADS/Online	IBM 370, 3080s, 3090s, 4300, 9370 series or compatibles; Siemens 7500, 7700 series	Between all operating environments supported	Yes	Programmer	IDMS/R	Yes	Yes	Compiled	Yes	Both	No	No	No	NP
Datatron, Inc. (312) 993-0065	Datatron	IBM PC, XT, AT or compatibles, IBM mainframe, Honeywell mainframes	OS/DOS, CICS	Yes	End user, programmer	No	Yes	Yes	Interpretive	Yes	Menus	Yes	No	No	\$390-\$20,000
Digital Equipment Corp. (DEC) DIGITAL	VAX Rally	VAX/VMS	None	No	Programmer	RDB/VMS	Yes	NA	Table driven	No	Both	No	Yes	No	NP
ESI (904) 575-0179	Group Four Application Generation System	Unisys A/V series, B1000, IBM PC or compatibles	Unisys MCP, MS-DOS	Yes	End user, programmer	Unisys DMS II	Yes	Yes	Compiled	Yes	Both	No	No	No	\$45,000-\$139,000
Execucor Systems, Inc. (512) 346-4980	IFPS/Plus	IBM PCs or compatibles; Prime; DEC; Honeywell Bull; HP 3000; Sun Unix Model 3, 386i; Apollo Domain 3000, 4000	NP	Yes	End user	NP	Yes	Yes	Interpretive	NP	Menus	No	No	IFPS modeling	\$40,000-\$150,000

¹American National Standard Institute ²Plug-compatible mainframes ³Data base management systems

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, this is designated NP (not provided). When a question does not apply to a vendor's product, this is designated NA (not applicable). Further product information is available from the vendors.

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VM Inter-System Facilities (ISF) from IBM

IBM's ISF requires that you use HPO.

IBM's ISF does not support Group 10 and 20 processors. In Group 30, ISF only supports 4381's with 16 megabytes or more, and 3083's. In Group 40, ISF does not support the 3081 D16 processor.

IBM's ISF is limited to four CPUs.

IBM's ISF offers no switching capability.

IBM's ISF doesn't do load balancing.

With IBM's ISF, you can't use IUCV and VMCF across processor boundaries.

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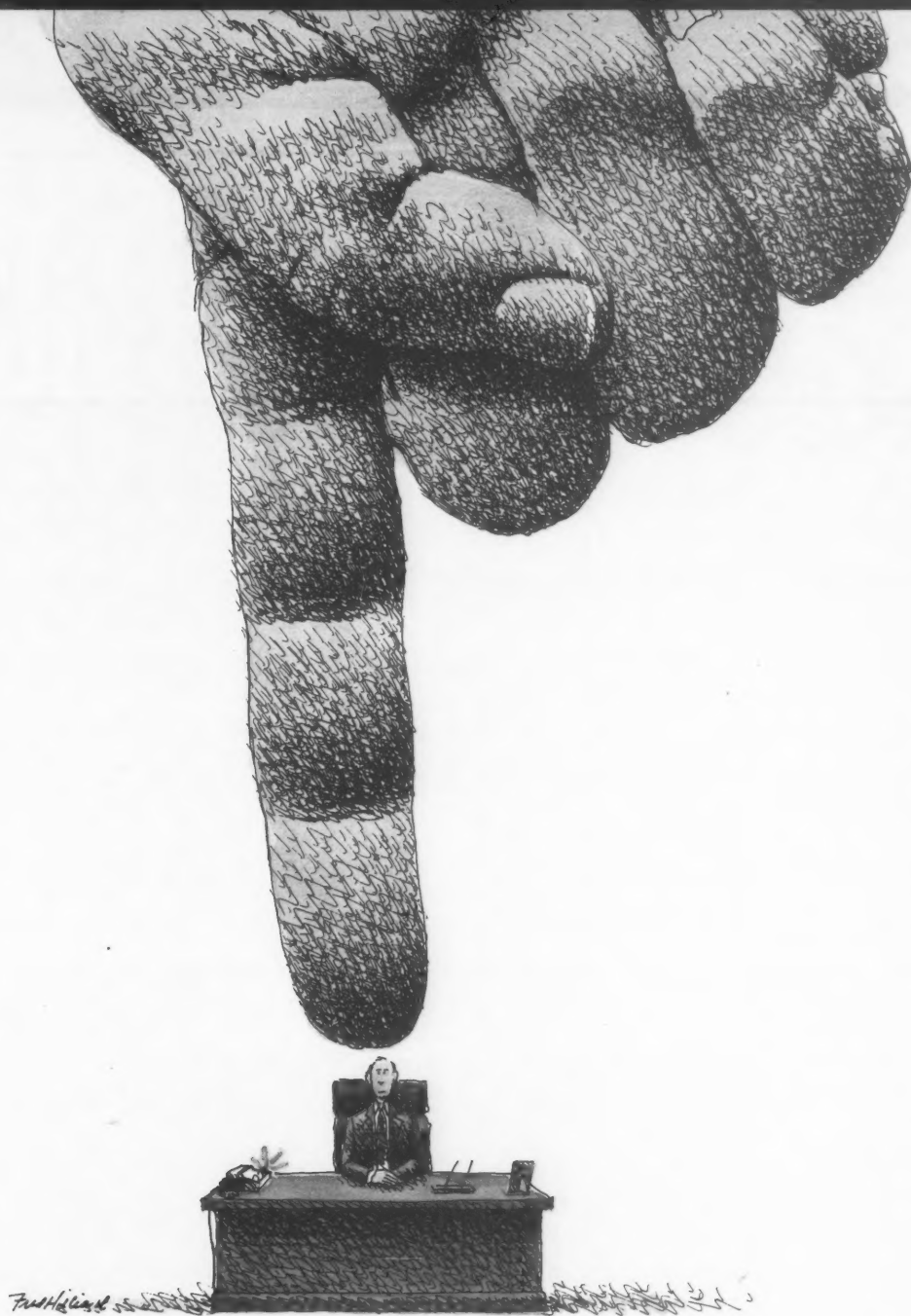
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COMPANY	PRODUCT	HARDWARE PLATFORM	DIRECT PORTABILITY TO WHAT OPERATING ENVIRONMENTS	SUPPORTS COOPERATIVE PROCESSING	TYPICAL USER	INTEGRATED WITH DBMS	INTEGRATED WITH DATA DICTIONARY	INTEGRATED WITH APPLICATION GENERATOR	INTERPRETIVE/COMPILED LANGUAGE	AUTOMATIC SYNTAX CHECKING	USES MENUS/PROMPTS	USES WINDOWING FOR DEVELOPMENT	INCORPORATES WINDOWS IN CREATED APPLICATIONS	SUPPORTS SQL	PRICE
Flexware (518) 961-0237	Flexware Development System	Mac Plus, SE, II	MS-DOS, VAX/VMS	No	Programmer	Flexware	Yes	Yes	Compiled	Yes	Both	Yes	Yes	No	\$1,500-\$3,000
Help/38 Systems, Inc. (512) 933-0609	Open	IBM System/38, AS/400	CPF, AS/400	Yes	End user	CPF, AS/400	Yes	Yes	Compiled	Yes	Both	Yes	No	No	\$11,950
Hewlett-Packard Co. (617) 890-8870	Info	Prime running Primos; Harris running VOS; Honeywell Bull running GC056, HV56; DG running AOS/V5; IBM running MS-DOS	Between all operating environments supported	Yes	Programmer, end user	No	No	No	Compiled	Yes	Both	No	Yes	No	\$5,000-\$40,000
Hewlett-Packard Co. Contact local dealer	Allbase/4GL	HP 3000 series 900, HP 9000 series 300, 800	MPE XL, HP-UX	No	Programmer	Allbase	Yes	No	Interpretive	Yes	Menus	No	No	ANSI	\$3,450-\$44,000
Honeywell Bull, Inc. (617) 895-0000	IGS	DPS7, DPS7000	NP	Yes	End user	IDS II	Yes	Yes	Compiled	No	Both	No	Yes	No	\$12,000
	System 80	DPS6, 6 Plus, 8, 80, 8000, 90	NP	No	Programmer	IDS II	Yes	No	Compiled	Yes	Both	No	No	No	\$5,200-\$9,500
IBM Contact local sales office	Cross System Product	IBM/370; 3000 series, 9370; 4300; 8100; IBM PC	IBM only	No	Programmer	DB2, SQL/DS	No	Yes	Interpretive	Yes	Menus	No	No	Yes	\$12,000-\$60,000
Information Builders, Inc. (313) 736-4433	Focus	IBM running MVS, VM/MSE; DEC running VMS/Decnet; Wang VS; PCs running MS-DOS, PC-DOS, OS/2; Apollo running Unix; AT&T 3B; IBM RT; Motorola series 8000; NCR Tower; Philips 9070	Between all operating environments supported	Yes	Programmer, end user	Focus, DB2, IMS, VSAM, IDMS/R, Adabas, Dbase, Ingres	Yes	Yes	Interpretive	Yes	Both	Yes	Yes	ANSI	\$795-\$125,000
Information Resources, Inc. (617) 890-1100	Express	IBM running MVS, VM; VAX/VMS	None	Yes	End user	Express	Yes	No	Both	Yes	Prompts	No	Yes	No	\$65,000+
	PC/Express	IBM PC, PC XT, AT, PS/2 or compatibles	None	Yes	End user	Proprietary	Yes	Yes	Both	Yes	Both	No	Yes	No	\$1,495
Informix Software, Inc. (415) 322-4100	Informix-4GL	IBM PC, XT or compatibles, Altos 3068, VAX, Cray-2	DOS, OS/2, Unix, VMS	No	Programmer	Proprietary	Yes	No	Compiled	Yes	Both	No	Yes	ANSI	Unix: \$1,800 DOS: \$995 OS/2: \$1,500 VMS: \$4,300
	Informix-4GL Rapid Development System	AT&T 3B2, 3B20, 3B4000 series, Altos 3068, Amdahl 580, Microvax, Intel 386/320, HP Series 9000, Sequent Symmetry, Sun 3 Series, Unisys 6000/50	DOS, Unix	No	Programmer	Proprietary	Yes	No	Interpretive	Yes	Both	No	Yes	ANSI	Unix: \$1,800 DOS: \$1,495
Intelligent Information Systems, Inc. (212) 966-4468	IIS/Destiny	VAX/VMS	None	No	Programmer, end user	Proprietary	Yes	Yes	Compiled	Yes	Both	Yes	Yes	No	NP
Intersystems Corp. (617) 621-0000	M/SQL	VAX, PDP-11; DG Eclipse MV; IBM PC, mainframes; Altos 386 series 1000, 2000	VMS, AOS/V5, PC DOS, MS-DOS, VM, Unix	Yes	Programmer	M/SQL	Yes	Yes	Compiled	Yes	Both	Yes	Yes	ANSI	\$99-\$119,900
I. P. Sharp Associates, a Hewlett Co. (416) 364-5361	Viewpoint	IBM 370, P9070	None	Yes	End user	Proprietary, DB2, Adabas	No	Yes	Interpretive	Yes	Both	No	No	No	NP
Koala Development Corp. (407) 330-1704	Add system	IBM System/34, 36, PC, AS/400	PC, System/34, MS-DOS, AS/400	No	Programmer, end user	No	Yes	Yes	Compiled	Yes	Both	No	No	No	\$33,960 or \$100 per month rental fee
Magna Software Corp. (212) 691-0300	MAGNA	CDC Cyber series	NOS, NOS/VE, NOS/BE	Yes	End user, programmer	No	Yes	Yes	Compiled	Yes	Prompts	No	No	No	\$48,000-\$99,500
McCormack & Dodge Corp. (800) 343-0325	Millennium: Systems Development Tool	IBM, Fujitsu, ICL	MVS, OS, DOS, VSE, ADM, VME	No	Programmer	IMS, DB2	Yes	Yes	Interpretive	Yes	Both	Yes	Yes	ANSI	NP
McDonnell Douglas Information Systems Group (714) 250-1000	Pro-IV	AT&T 3B1, 3B2; Microvax; Honeywell Bull DPS 6 series; IBM PC XT, AT, PS/2, 3030, 3080, 3090, 4300 series, 9370; NCR Tower 32, Mini XP; Plexus P15-P75	All attached environments	NP	Programmer	No	Yes	Yes	NA	Yes	Both	Yes	Yes	ANSI	NP
MDBS, Inc. (317) 447-1122	Knowledgebase/2	IBM PCs or compatibles; VAX	VMS	No	Programmer	Knowledgebase/MDBS III	Yes	No	Interpretive	No	Both	No	No	IBM	\$695
MultiSoft, Inc. (609) 896-4100	Infront	IBM PC, PC XT, AT, PS/2 or compatibles	None	Yes	Programmer	Infront B-tree data base	No	No	Compiled	Yes	Both	Yes	Yes	No	\$15,000
Nast Software International (303) 845-5000	Nomad	IBM 370, PC AT, PS/2 or compatibles; VAX	VM/CMS, MVS/TSO, MVS/XA, PC-DOS VMS	Yes	Programmer, end user	Nomad	Yes	Yes	Compiled	Yes	Both	Yes	Yes	Extended ANSI	\$795-\$150,000
National Information Systems, Inc. (408) 985-7100	Accent R	VAX	RMS, A/UX	No	Programmer	Accent R's DBMS, Britton Lee shared data base	Yes	Yes	Compiled	Yes	Both	Yes	Yes	No	\$4,000-\$125,000
Netron, Inc. (416) 636-4847	Netron/Cap Development Center	IBM mainframes, PCs; VAX; Wang VS	MVS/TSO, VM/CMS, VAX/VMS, Wang VS	Yes	Programmer	No	No	Yes	Compiled (Cobol)	Yes	Both	No	Yes	ANSI	NP



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COMPANY	PRODUCT	HARDWARE PLATFORM	DIRECT PORTABILITY TO WHAT OPERATING ENVIRONMENTS	SUPPORTS COOPERATIVE PROCESSING	TYPICAL USER	INTEGRATED WITH DBMS	INTEGRATED WITH DATA DICTIONARY	INTEGRATED WITH APPLICATION GENERATOR	INTERPRETIVE/COMPILED LANGUAGE	AUTOMATIC SYNTAX CHECKING	USES MENUS/PROMPTS	USES WINDOWING FOR DEVELOPMENT	INCORPORATES WINDOWS IN CREATED APPLICATIONS	SUPPORTS SQL	PRICE
On-Line Software International, Inc. (609) 799-6300	Ramix Information System	IBM 370; 3000, 4300 series or compatibles	CICS, OS, MVS/TSO, VM/CMS, DOS, VSE, MVS/XA	No	End user	Ramix, DB2, SQL/DS, IDMS/R, Datascom/DB, Total, Adabas, IMS, DL1	Yes	Yes	Compiled	Yes	Both	No	Yes	ANSI	\$49,000-\$126,000
	UFO Productivity System	IBM 370; 3000, 4300, 9370 series	TOS, CMS, CICS, IMS/DC	No	Programmer	No	Yes	Yes	Interpretive	Yes	Menus	No	No	ANSI	\$35,000-\$50,000
Oracle Corp. (415) 598-8209	SQL Reportwriter	VAX/VMS, Sun	VAX/VMS, MS-DOS, VM/CMS, MVS, Unix	Yes	Programmer	Oracle, DB2	Yes	No	Compiled	Yes	Both	Yes	No	ANSI	NP
Panasonic Systems, Inc. 1-800-323-7335	GENER/OL	IBM 360, 370, 4300 series, 3000, 9370	DOS/VSE, OS/VSI, OS/MVS, MVS/XA	No	Programmer	DB2, SQL/DS, IMS, DLI, TOTAL, Datascom	No	No	Both	Yes	Menus	No	Yes	ANSI	\$35,000-\$50,000
Phoenix Software Co. (213) 338-0400	Cygnit	IBM mainframes	DOS/VSE/SP, MVS/XA, OS/VS/1	Yes	Programmer	SQL/DS, IMS, DB2, DL1	Yes	No	Compiled	Yes	Both	Yes	Yes	ANSI	DOS-\$28,000; OS-\$38,000
Plexus Computers, Inc. 408-943-9433	Applications Designer	Plexus Extended Data Processing (XDP) System	None	Yes	Programmer	Plexus	Yes	Yes	Compiled	Yes	Both	Yes	Yes	ANSI	\$895-\$4,995
Progeni 818-956-0251	Progeni GLE	Unisys A/V series	NP	Yes	Programmer	DMS II	Yes	Yes	Compiled	Yes	Both	Yes	Yes	No	\$30-\$90,000
Progress Software Corp. (617) 275-4500	Progress	More than 140 microns, minis	Unix, Xenix, Ultrix, MS-DOS, VAX/VMS, CTOS/BTOS	Yes	Programmer	Progress	Yes	Yes	Compiled	Yes	Both	Yes	Yes	ANSI	\$1,000-\$125,000
Relational Technology, Inc. (415) 748-3398	Ingres/Applications	IBM mainframes; VAX; AT&T 3B series; NCR Tower; DG MV 20000; Andahl; Pyramid; Unisys 5000 Model 60, 80; HP 9000	VMS, Unix, VM/CMS, MS-DOS	Yes	Programmer	Ingres, RMS, Dbase III	Yes	NP	Compiled	Yes	Both	Yes	Yes	ANSI	\$3,000-\$140,000
Response Technology, Inc. (306) 624-4273	Insyte	Unisys A 1000, B 1000 series	None	No	End user	DB2	Yes	Yes	Both	Yes	Both	No	No	No	\$24,000-\$44,000
Sage Software, Inc. 1-800-638-8703	APS Development Center	IBM 370 series, PS/2	MVS, OS/2	Yes	Programmer	DB2, IMS, VSAM, IDMS	Yes	Yes	Compiled	Yes	Both	Yes	No	ANSI	\$3,500-\$300,000
SAS Institute, Inc. (919) 467-9000	SAS System	IBM mainframe, PC AT, PS/2, VAX; HP; DG; Prime minis	Between all operating environments supported	No	Programmer, end user	IMS, DB2, SQL/DS	No	Yes	Interpretive	Yes	Both	Yes	No	ANSI	NP
Signal Technology, Inc. (805) 683-3771	Smartstar	VAX	None	No	Programmer, end user	RDBF	Yes	Yes	Interpretive	Yes	Both	Yes	Yes	ANSI	\$8,000-\$95,000
Software AG of North America, Inc. (703) 860-5050	Natural	IBM mid-range, mainframe; DEC micro, mid-range, 8000 series	MVS, MVS/XA, VS/1, VM, DOS, VMS	Yes	Programmer	Adabas, IMS, DL1, DB2, VSAM	Yes	Yes	Compiled	Yes	Both	Yes	Yes	ANSI	\$25,000-\$150,000
SIR, division of Inter Systems, Inc. (312) 480-9270	PQL	VAX; IBM mainframe, PC, PS/2	Any that run SIR DBMS	No	End user	SIR DBMS	Yes	Yes	Interpretive	Yes	Both	No	No	ANSI	\$1,500-\$120,000
Sterling Software, Inc./Answer Systems Division (818) 716-1616	Answer/PR	IBM mainframes	IMS/DC, CICS, CMS, Batch	Yes	End user	Supports any DBMS	Yes	Yes	Compiled	Yes	No	No	No	ANSI	\$13,500-\$56,250
Sterling Software/Dylakor Division (818) 718-8877	DYL-280 II Advantage	IBM mainframes, PCs	None	No	Programmer, end user	DB2, SQL/DS, IMS, DYL, VSAM, IDMS	Yes	Yes	Compiled	Yes	Both	No	No	ANSI	\$15,000-\$23,400
Thorn EMI Computer Software (617) 256-3900	PCS	IBM PC, DEC, Wang, DG, HP, Honeywell Bull	MVS/TSO, VM/CMS	Yes	End user	IDS, SQL/DB2, IDMS, Adabas	Yes	Yes	Interpretive	Yes	Both	Yes	Yes	Proprietary, IBM	NP
Tom Software, Inc. (206) 246-7022	Speed II	Wang VS	VAX	Yes	Programmer, end user	VS DMS	Yes	Yes	Interpretive	Yes	Both	Yes	Yes	No	\$3,750-\$90,000
Tommy, Inc. 513-984-6605	Mach 1	DG 4000, 8000, 10000, AT&T 3B2 series, VAX, Microvax II, IBM System/34, 36, 9370, NCR Tower, XP, 400, 600, 800	AOS, Unix, VMS, CICS, assembler	Yes	Programmer	Proprietary	No	Yes	Compiled	Yes	Both	No	Yes	ANSI	NP
Unify Corp. (916) 920-9092	Accell	IBM, DEC, NCR, Unisys, HP, Sun	Xenix	Yes	Programmer	Unify relational DBMS, SCO Integra	Yes	Yes	Neither	No	Menus	Yes	Yes	ANSI	\$2,995-\$120,000
Unisys Corp. 215-542-4386	Ally	Unisys PC IT, PC/micro IT or compatibles, Unisys U7000/30, 40, 50, 51, 52, U8000/50, U5000/85, 90, 95, U5000/30, 35, 50, 55	MS-DOS, Unix	Yes	End user, programmer	Dbase III, Oracle, Unify, CISAM	Yes	Yes	NA	Yes	Both	Yes	Yes	Proprietary	NP
	Mapper, Mapper C	Unisys 1100, 2200, A series, MS-DOS PCs	OS/1100, MCP Unix, MS-DOS	Yes	End user	No	Yes	No	Interpretive	Yes	Both	Yes	No	ANSI	NP
	LINC II	Unisys A/V series, Unisys 1100, Unisys 2200	Unisys A/V series, OS/1100	Yes	End user	A/V series, DMS II, 1100/2200 RDMS	Yes	Yes	Compiled	Yes	Menus	No	No	ANSI	NP
XRT, Inc. (215) 254-0300	APG	IBM PC	None	No	Programmer	Proprietary	Yes	Yes	Compiled	Yes	Both	Yes	Yes	Proprietary	\$495
Zantho Information, Inc. (613) 727-1397	Zim	Sun, DEC, AT&T, DG, Unisys, Novell, Concurrent, Wang, Kowin, HP	All platforms supported	No	Programmer	Zim, Zim/ISQL	Yes	Yes	Both	Yes	Both	Yes	Yes	ANSI	NP



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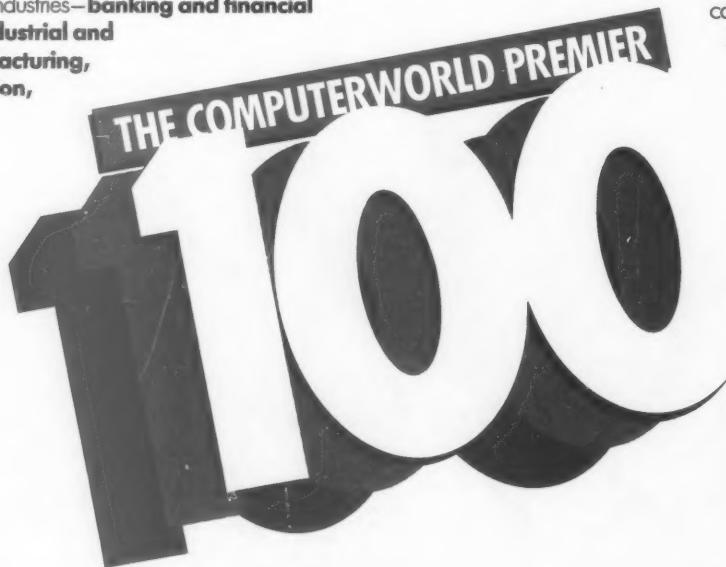
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IN DEPTH

Bad language

All the software tools in the world won't bail out an inarticulate programmer

BY DAN NOLAN

All too frequently, we hear the lament "Johnny can't read." Neither can he write. Nor code.

To write software, you have to communicate through language — the English language. You do not have to do square roots in your head or be able to give the day of the week for any arbitrary date. You do have to be able to express an action in terms of subject and predicate and properly use nouns, verbs and clauses.

Sound far-fetched? Think about this: Programming is nothing more than the practical ability to communicate with an obtuse, literal machine. Those who cannot write well cannot program well.

Yet students now bypass the fundamentals of language. Elementary educational systems are placing less emphasis on basic communication skills, waiting perhaps for a miracle in language equivalent to that of "new math."

This does not bode well for the future. Speech and writing will not be replaced by the computer as arithmetic was by the pocket calculator, at least not in a practical time frame.

Double-edged sword

Many programmers, undereducated and consequently unable to keep up with the technology, typically find themselves in one of two predicaments.

They either develop programs aimed at solving programming flaws that really lie with

themselves, or they shelve good programming tools because they lack the skills that are necessary to use them.

Case #1: Ada resulted from conclusions reached by a panel of programmers that determined, among other things, that the problem with programming lay not with the programmers themselves but with their tools.

The truth is that products such as Ada, APL and IBM's PL/I have failed to prove their superiority over even the most basic Cobol language.

Until languages integrate all aspects of the modern computer, especially operating systems, data dictionaries and different peripheral equipment, they will continue to be reflections of the first programs written during the primitive beginnings of data processing.

There is no reason to believe that other so-called "super languages" will be any more capable of improving the lot of programmers. Nor will SQL, artificial intelligence and other such concepts that would replace real intelligence with purchased expertise eradicate poor programming.

At this point, it

is not at all reasonable to assume that further technical advances alone will rescue the programming community. An organization will be better served by providing training to overcome practical shortcomings.

Case #2: You would think that tools such as relational data base management systems and high-level fourth-generation languages would let programmers deliver simple up-stream applications sooner and cheaper than a decade ago.

The sad reality is that many programmers, lacking basic language skills for whatever reason, are unable to use these tools effectively. The new tools bewilder the underskilled programmer, leading him to come up with all kinds of excuses for project delays. One of the more popular cop-outs is the old whine heard during the Fortran and RPG days that "the language is not up to the problem."

Not at fault

Actually, the language can more than handle the problem. The

first fully relational DBMS/ fourth-generation language pair, Adabas and Natural from Software AG of North America, Inc., could produce applications hundreds of times better, faster and more reliable than any competing product.

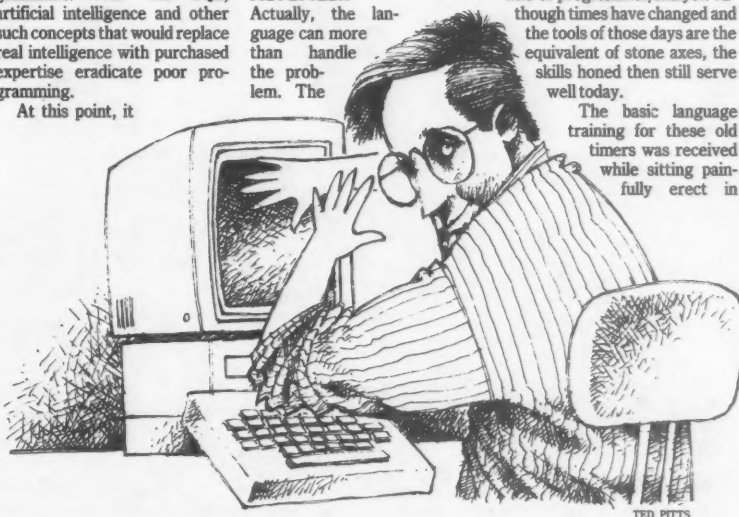
Regrettably, the products were often assigned to those who were accustomed to being towed along by a computer rather than driving it.

Freed from the constraints of primitive languages and DBMSs, many programmers introduced to the Adabas/Natural combination found themselves confronting their own shortcomings — shortcomings that stemmed from their lack of training in the King's English, inadequacies caused by an educational system that failed to teach students the basics.

Still useful

Once upon a time, the pinnacle of success in this industry was the title of programmer/analyst. Although times have changed and the tools of those days are the equivalent of stone axes, the skills honed then still serve well today.

The basic language training for these old timers was received while sitting painfully erect in



Nolan is an independent consultant in Annandale, Va., who specializes in developing business application software in Software AG of North America, Inc.'s Adabas and Natural.

- You have to write, not do square roots
- The role of Ada, Natural
- When someone "fixes up" correct code

spruce-and-steel torture chairs in an elementary school class.

Their reward for spending endless hours studying grammar? They can conjugate verbs and parse sentence structures into subject and predicate, identifying noun, verb, adverb and adjective.

So when you hear the oft-used excuse that "the language was not up to the problem," you

should examine the various skills of the staff. Better yet, have them explain the situation — in writing.

Symptoms of programmer illiteracy surface more and more often in production code. The simplest alternative to clear understanding — whether the words are spoken or written in code — is repetition. A poor speaker must restate his

thoughts several times before making his meaning clear.

Similarly, the programmer who lacks good language skills must often make several attempts to get the machine to perform a function.

Natural inclination

Housekeeping perfunctorily records each attempt. Once the programmer finds the correct

phrase, the natural inclination is to leave well enough alone and not touch the program for risk of causing another error and more delay. The unsuccessful attempts are left behind in memorabilia to the effort, as the following example illustrates:

```
1010 COMPUTE BASE =
    SALARY/52
2020 COMPUTE ROUNDED
    BASE = SALARY/52
```

```
2040 IF #WEEK = 52
2050 COMPUTE ROUNDED
    BASE =
2060 SALARY - SALARY/52 *
    51
3060 IF #WEEK = 52 DO
3070 COMPUTE ROUNDED
    #PAST = SALARY/52
3080 MULTIPLY #PAST BY
    51
3090 COMPUTE BASE =
    SALARY - #PAST
3100 DOEND/* (3060)
```

This code from a commission program illustrates the problem

IN THIS industry, there is little reward for being efficient. Programming is akin to construction. Once you've built the house — the software program — your job is finished.

a programmer had with making the total payments for the year agree with the sum of the months. The desired product, BASE-PAY, was achieved after trial and error.

Because the old code was never deleted from the program, the initial cumbersome process is continually repeated every month. Although tiny, such waste accumulates to the point where new equipment is warranted. Such repetition has been increasing in later versions of most software. Many technological advances such as increased speed and machine memory size are being consumed by programmers with little benefit to the final product.

Trial and error

Programmers unable to identify the constituent parts of human language will find they cannot easily communicate with computers. It is only through a time-consuming process of trial and error that they can eventually accomplish the task.

And who determines a task's level of difficulty and the length of time this task should take to complete? The programmer.

Do not expect this nonproductive situation to change in the near future.

In the computer industry, there is little reward for being efficient. The nature of programming is akin to construction. Once you've built the house — the software program — your job is finished.

The programmer who stretches out a task will be paid more, if only by consequence of being employed longer.

The proficient programmer finishes earlier and will be found occupied elsewhere — not necessarily in the same organization.

Proficiency tends to be

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rewarded with termination. In effect, then, the expert programmer will often be one who has had the most problems programming.

Laying blame

But fourth-generation languages overcome most of the simple problems with programming, you say. Exactly my point, I say. The introduction of fourth-generation languages left programmers bearing the responsibility for delays.

When delays continued to occur, rather than talk to others who did not share the problem and risk any question of competence, programmers blamed their tools.

One of the most frequently cited problems in the case of the Natural language was an apparent inability to perform array processing. Arrays are things in a series, and array processing is the ability to handle them all or each as an individual.

"Old" programmers — those who have been professionals since before the days of fourth-generation languages — work with arrays as a matter of course and will make their own array when the language does not provide one.

"New" programmers tend not to recognize an array when they see it, much less understand how it should work.

Using the 'old' method

An example of the inability to apply language rules to a computer is a straightforward electronic mail screen.

In this case, there is one space for the subject of the letter and 15 lines to write in. This particular piece of program code checks that the subject is provided and that at least one of the lines is filled in.

First, there is the "old" way of doing this:

```
1050 IF SUBJECT = '' AND
    LINE (1) = ''
1060 AND LINE (2) = '' AND
    LINE (3) = ''
1070 AND LINE (4) = '' AND
    LINE (5) = ''
```

...

```
1130 REINPUT 'Subject and
    contents needed, please.'
```

The REINPUT appears on the screen again, with a prompt for the user.

Now we have an attempt to do this as an array, drastically reducing the number of lines needed:

```
1050 IF SUBJECT = '' AND
    CONTENT (1-15) = ''
1060 REINPUT 'Subject and
    contents needed, please.'
```

It does not work. The REINPUT message always appears, regardless of what is entered on the screen.

The programmer reverts to the old code and gives this as an explanation to the designer, the designer to the supervisor and so

PROGRAMMERS UNABLE TO identify the constituent parts of human language will find they cannot easily communicate with computers.

on until someone writes an angry letter to the vendor of the software.

Upper management endorses said letter since it generally passes any comment on to the

vendor without alteration.

The vendor, who works on the assumption that the disgruntled person is qualified, assigns a person to correct the code. On verifying that it does not work, the vendor sets about adding the capability to the new, improved language.

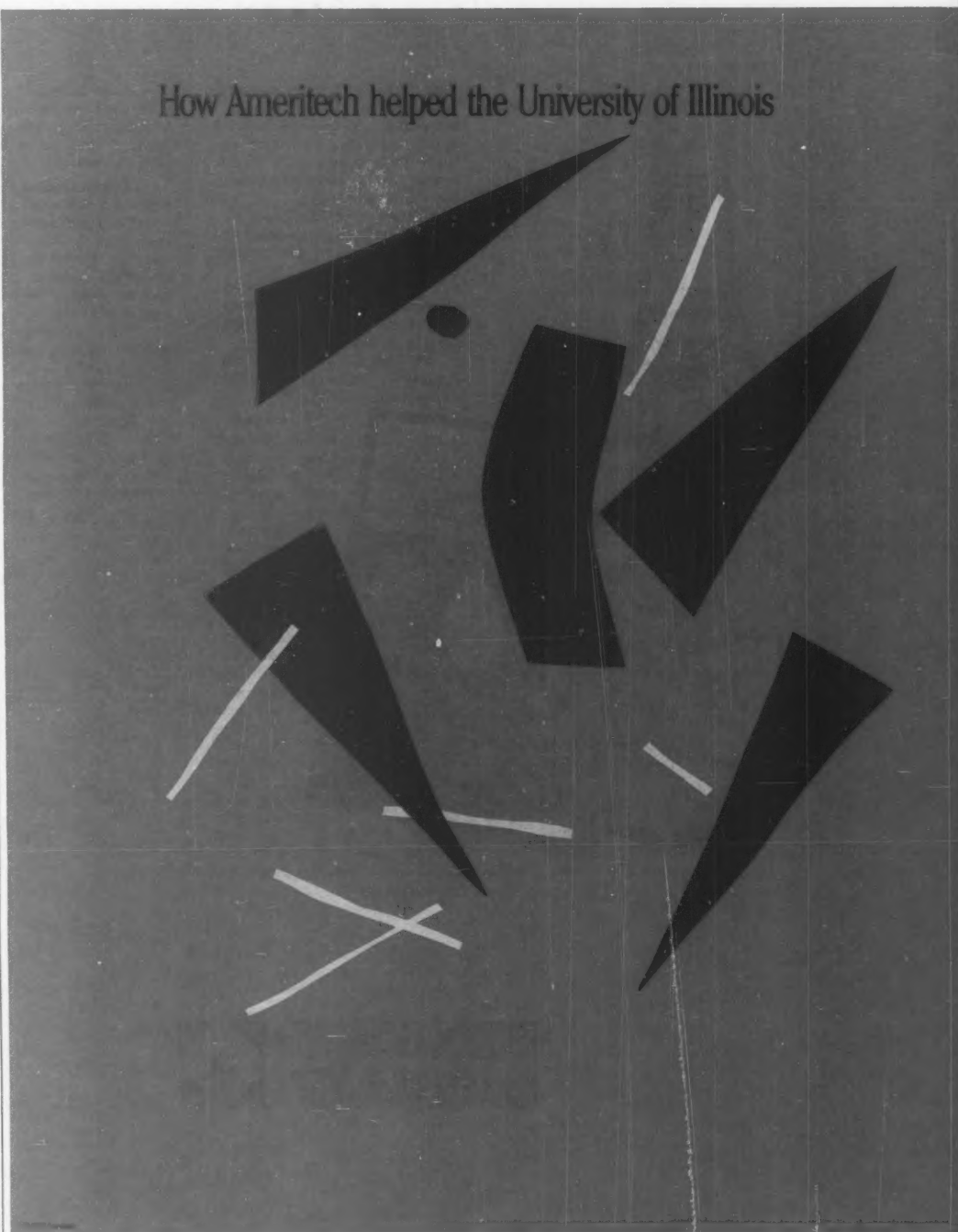
In fact, the original code did indeed work. The computer did exactly what the code had asked

for. Examine the code that was produced miles away and months earlier by yet another programmer:

```
1050 IF SUBJECT = '' DO
1060 IF CONTENT (1-15)
    NOT = '' IGNORE
1070 ELSE REINPUT 'Subject
    and contents needed, please.'
1080 DOEND/* (1050)
```

The problem: The "old" method checked every field. The

How Ameritech helped the University of Illinois



"wrong" method would work only if every field had been filled in.

If the programmer had tried entering every field, the solution would have been obvious: Any blank line indicated a need to reinput a prompt.

The approach taken by the successful programmer was to structure the question as if he was addressing a young child: "If

there is no subject, check the contents. If all are blank, it is okay, otherwise reinput a message."

Because this is the way the successful programmer usually communicates with the computer, most of his code causes no problems.

Interestingly enough, this particular successful programmer caught wind of the kind of

trouble that his peer was experiencing.

However, since the nature of the problem was described in stilted terms, the successful programmer decided it was some strange combination unique to that particular colleague's situation.

Consequently, the true nature of the problem and any solution avoided the vendor and other

programmers alike — until the vendor "fixed" the language so that the wrong code did indeed work.

Possible hypothesis

Of course, now the "correct" program will fail. Several conclusions can be proposed in this situation:

- Those who write clearly are manipulative, always managing

to get the easiest assignments.

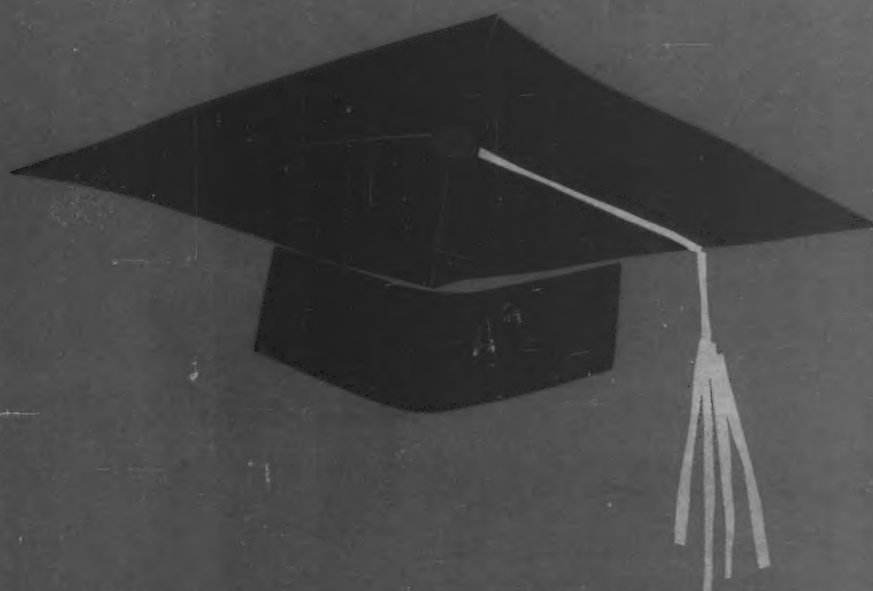
- Those who write clearly spend less time with problems. Or they may, in fact, never encounter problems. Or they resolve problems by rephrasing the question or instruction.

- People who cannot be understood are geniuses, so management assigns them the toughest projects.

- Programmers who cannot be understood create problems.

- Programmers who express themselves clearly have more time away from the computer.

advance to the head of the class.



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AN ORAL conversation between a computer operator and a programmer will indeed be like dealing with separate species.

They will eventually stop programming as they are assigned to tasks that make better use of their communication skills, leaving the remaining work to be done by those particular programmers who lack basic communication skills.

Talk to me

Last, consider the implications if and when the ability to program directly by voice materializes. Think about solving obvious problems with direct vocal programming in any of the following ways:

- Establish common syntaxes.
- Provide for dialects.
- Identify homonyms: "The program has run" vs. "I have to run" vs. "My stocking has a run."

Demonstrations of voice-actuated typewriters and concurrent compilers indicate that we are fairly close to having conversational programming.

Someday, a large firm will tie these together with the promise that all our programming troubles are over.

Sure they are.

At least once a year, programmers find themselves on the phone engaging in "conversational programming" with the operator who either rousted them out of bed at 3 a.m. or interrupted their vacation.

As the programmer talks, the operator types. Usually, what would take five minutes is finished in 30 — and by that time, both parties are finished with each other.

Even when people are motivated by a common objective, communication can be difficult. An oral conversation between a computer operator and a programmer will indeed be like dealing with separate species.

Perhaps the programming skills needed then will resemble those of an animal trainer more than those of a technician. •

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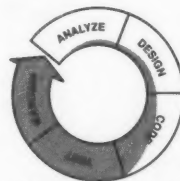
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MANAGEMENT

TAKING CHARGE

Michael Pepelea

How to sell MIS projects



With all the attention currently paid data administration, and all the discussion about its benefits, one key element is usually forgotten: gaining top management commitment.

Most MIS managers know the benefits of data administration but become frustrated in trying to communicate those benefits to top management. MIS managers sometimes fail to realize that selling the concept of data administration is like selling any other business idea: The best approach is to tie the benefits directly to key business problems and demonstrate the idea's ability to solve those problems.

The usual approach to selling data administration involves a high-level presentation to upper management by a data administration guru in the hopes that upper management will become enlightened and support data management. These presentations usually include discussions on general theory, data processing trends, the benefits of data in integrated systems and some examples of successful companies that have adopted data administration principles.

The problem with this approach is that upper management is usually not interested in general theoretical discussions.

Continued on page 76

Melding old and new

McCaig balances technical, business skills

BY DAVID A. LUDLUM
CW STAFF

NEWARK, N.J. — Introducing himself to a roomful of fellow MIS executives at a recent conference, Charles McCaig alluded to his background as a systems programmer and joked that he had never been asked to stop by a party to live things up.

But in addressing the crowd, McCaig belied his own stereotype of the technician as an inconspicuous introvert as he livened up the business gathering with deadpan, self-effacing humor.

McCaig has also helped dispel the notion of the manager with a technical upbringing as detached from business concerns. As Mutual Benefit Life Insurance Co.'s senior vice-president for information services since 1981, McCaig has done the following:

Continued on page 80

PROFILE

Charles McCaig



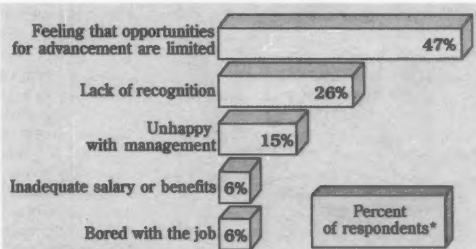
Position: Senior Vice-President for Information Services, Mutual Benefit Life Insurance Co.

Mission: Modernize the processing of policy applications, implement state-of-the-art data center, merge business and technical aspects of MIS.

Data View

Why good workers quit

Top executives and personnel directors say firms risk losing their best employees by failing to recognize achievement and not providing advancement



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CREATIVITY IN MIS

Are bright ideas lighting up your shop?

BY DANA DAVIS
SPECIAL TO CW

Many MIS managers are probably familiar with the expression, "Necessity is the mother of invention." However, they may not be aware of the creative thinking process that spawned that product or program. Where do innovative and award-winning ideas come from? How did the inventor arrive at the final solution?

Some might speculate that only those possessing truly brilliant minds develop concepts that will result in valuable contributions to the company. Yet most managers will concur that their employees are not candidates for Mensa. Even though they may pray for their personnel departments to locate the occasional genetic miracle, managers realize that solving problems often involves a series of pedestrian tasks and is generally not the product of some Phi Beta Kappa whiz kid.

"There's no magic method for problem solving," says Bard White, director of MIS at Spalding, Inc. in Chicopee, Mass. "We get our ideas all over the place. We go to trade shows. We talk to vendors. We maintain communication with our sales force and join them on sales calls. We listen to our end users. I'd say half our ideas come from end-user requests."

Spalding's MIS department enjoys a "distinct advantage because MIS is perceived as having a real impact on the bottom line," says Brian Mason, project manager and assistant to White. "We learn the whole business. We speak with everyone from senior management to secretaries," he comments, adding, "As a



TOM PAYNE

result, we get a real synergy."

They also get some good ideas. For example, each member of Spalding's sales force receives 35mm slides depicting product information that the team uses to educate sales prospects. "It was costing us \$35 to \$40 to produce each slide out of house. At a typical trade show, we gave out 600 to 700 slides," White says. Spalding's MIS department recognized the need to cut costs without jeopardizing sales.

"Our administrative assistance requests."

Continued on page 77

Few data centers planning for The Big One

BY JAMES A. MARTIN
CW STAFF

Chances are it's coming, and you're not prepared.

A team of scientists at the U.S. Geological Survey came to some sobering conclusions recently. The scientists found there is a 50% chance of a major foundation-cracking, roof-caving earthquake in the San Francisco Bay area within the next 30 years. The Los Angeles region has an even greater possibility — 60%.

But according to many disaster recovery and contingency

planning consultants and experts, most corporate data sites are ill prepared to handle a catastrophe, earthquake-related or otherwise.

For example, out of more than 250,000 data centers in North America, only 3,200 subscribe to commercial hot-site services that would provide backup support and processing during a significant emergency, according to Tari Schreider, president of Contingency Planning Research, Inc. in Glenwood Landing, N.Y.

In addition, as few as 23% of all data centers in the U.S. have

tested and documented data disaster recovery plans, according to Hugh Smallwood, president of Data Base Recovery Services in Columbia, Md.

Nobody's safe

What's more, earthquake experts contend that destructive jolts are not limited to the West Coast. Fault lines in such dispersed locations as South Carolina, Missouri, Tennessee and Massachusetts have been known to erupt and can do so again at any time, without warning.

Under severe circumstances, such as a quake of 6.5 or more on

the Richter scale, staffing would be cut drastically as a result of injury, death or blocked thoroughfares. Telephone circuits would be scarce at best, bringing a near halt to on-line transactions. Data centers would be toppled, with computers crunched under fallen ceilings, cable connections snapped and tapes thrown from racks.

Almost immediately, the nation's financial transactions would become chaotic. Because of on-line fund transfers, foreign investments, cash management and other portfolio applications, a major earthquake would, within 24 hours, affect the entire banking community in the Southwest. Within 48 hours, the

entire economy of the U.S. would feel the strain and within 72 hours, the entire world would be affected.

What, then, can an MIS manager do to plan for such a disaster, and what can be done after it occurs?

Moving the corporate data center away from an earthquake-prone region is one possibility. Charles Schwab & Co. in San Francisco has been planning to move its main data center from the city's landfill-based financial district to more solid ground near Sacramento, Calif., but has postponed the move for economic reasons related to the cyclical stock market.

Continued on page 77

Pepelea

CONTINUED FROM PAGE 75

As practical business people, they are more interested in specific results. This is particularly true in industries in which top management is preoccupied with tactical issues, such as the shrinking demand for product in the metals industry and the mergers and regulatory changes in the transportation field.

Be specific

Rather than speak abstractly on the issues of data administration, MIS managers should demonstrate specific benefits. Begin on a small scale by linking the benefits of data administration to particu-

lar issues within the organization. Once concrete results are realized on a small scale, the results can be used to sell a comprehensive data administration approach.

To achieve this goal, three specific steps should be followed:

- Define the business problems.
- Solve the problems.
- Communicate the results.

The first step is to study key operational problems within the organization. Isolate a series of problems for each major functional area, including marketing, finance, operations and human resources.

If the firm has been involved in critical success analysis, a business systems plan, organizational reviews or similar

approaches, problems may already be defined.

If such efforts have not been made, MIS may engage in general interviews with key department executives to identify and define problems for use in selling data management concepts.

Once a series of problems has been defined, separate those that are directly related to data. These become candidate problems for demonstrating data administration principles. The data issues should include such things as poor data structure, data with multiple definitions among systems, data scattered among various systems and data security problems.

Two data problems should be selected as examples to be used in selling data

management concepts. The problems should be small enough that large resource commitments are not needed to address them, simple enough for top management to relate to data issues and yet significant enough that some measurable benefit can be gained through their solution.

During the solutions phase of selling to management, the most important step is to demonstrate specific data policies and actions that will solve or reduce the two selected data problems. These policies might include the standardization of data, organization of existing data and better sharing of the data among user systems. These policies should be specific and tied directly to the statement of the problem. These policies must be well thought out and attainable, since these criteria will be the measures of how well the problem is solved by using data administration.

Once the policies and their effects are defined and documented, the issue of data administration should be presented to top management, along with the two data-related problems from within the organization. This is where stated policies that will solve or reduce the problems should be communicated and where funding for the data administration projects will be addressed.

The green light

Assuming that a signal to proceed results from these discussions, the next step is to implement policies to address the data problems. The implementation should be established as a standard project with a set work plan, project scope and project team. This is important for two reasons.

First, establishing the data administration policies will probably involve groups such as data base applications programming and user departments. A means to manage those efforts is needed.

Second, during the execution of the project, progress must be communicated to top management. A well planned project will facilitate this communication and help control the project.

After the pilot data administration projects are completed, the final results should be communicated and the benefits reported to top management. This is probably the most important phase, for it will be the selling point that illustrates how successful the data administration effort has been. It is only at this point that a full commitment to data administration should be requested from top management.

At this stage, top management should have an understanding of the implication of data administration: what it takes to implement it and the benefits of a data administration approach. With this understanding as a foundation, a comprehensive policy can be sold.

The above approach by no means signals the end of selling data administration. It is only the beginning. After initial acceptance, a comprehensive plan that spans a multitude of data issues must be established and implemented, with the results communicated to top management. However, if techniques that demonstrate concrete results are applied, there exists a greater chance of success for top management commitment.

Pepelea is a manager on the consulting staff of Ernst & Whinney in Chicago.



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Bright ideas

FROM PAGE 75

tant had the idea of putting the data through our personal computer and making the slides at Spalding. We now do them in-house for \$1 each. She has saved us \$100,000 in slide production costs this year," White points out, noting, "Yes, she did receive a raise."

While other companies may not have problems as graphically obvious as Spalding, managers may experience dilemmas they do not know how to approach, much less solve. At this point, an information systems creativity specialist may be brought in.

Unlocking potential

John Cunningham, president of Competitive Technologies in Easton, Conn., helps clients "unlock" their information systems thinking potential. Competitive Technologies is run as a joint venture with Synectics, Inc. in Cambridge, Mass. Both Synectics and Competitive Technologies operate on the premise that ideas can be deliberately stimulated.

Cunningham became acquainted with Synectics while working in the new product invention area at General Electric Co.'s corporate headquarters. Cunningham claims Synectics' powerful brainstorming sessions were instrumental in helping GE come up with its high-end, computerized, self-diagnostic dishwasher. Impressed by Synectics' program, Cunningham adapted the strategy to the information systems environment (see chart above).

Before he starts each program, Cunningham puts together an in-house team. "We select players carefully. Generally, I'm looking for people who have their necks on the line; people who have a stake in winning, people who will take some risks. These generally include line and functional managers," he says. "In the smaller companies, it would include the president or CEO. We want people who know the current practices cold." In addition, Competitive Technologies believes introducing diverse elements into a given situation can produce unexpected but successful results.

Brainstorming in MIS

One program for spurring creative thinking in information systems involves a six-step plan

1. Identifying opportunities
2. Inventing the process
3. Qualifying the process
4. Performing buyer-value analysis
5. Assessing competitive forces
6. Developing an information systems implementation strategy based on the results of the previous steps

INFORMATION PROVIDED BY COMPETITIVE TECHNOLOGIES
CW CHART

While some managers claim creativity courses are helpful, they don't necessarily believe these taught methods provide lasting value. "It's true that when you need to think something through, you have to withdraw the blinders," says Allen Smith, manager of corporate information services at Atlantic Richfield Co., or Arco, in Los Angeles. "In that respect, creativity courses are helpful. However, what happens a year after you take the course? You don't teach someone to be a manager just by sending them to managerial training programs."

Smith points out, too, that while he's read books on creativity — the kind that tell you to use humor or analogies — "ideas come from everywhere: contacts, brainstorming, planning,



Spalding's Mason

organizing, education, end users and plain hard work. The creative process is a combination of all those things."

He says "the real problem is that information systems innovation isn't rewarded. Info systems methodology involves checks and double checks. Creativity involves risk. No one really wants risk in the information systems environment."

No one likes having his idea labeled stupid or useless, either. Consequently, subordinates may hesitate to bring up different ideas that could be construed as offbeat or out of place by their peers or superiors.

"You have to work to get people to open up and convey their thoughts," says Michael S. Heschel, vice-president of information systems at Baxter Healthcare Corp. in Deerfield, Ill. "You also have to ensure that listeners do not convey criticism and that speakers don't become defensive. Otherwise, your session will shut down."

Heschel knows about developing a receptive atmosphere for new concepts. During the early '70s, he developed American Hospital Supply Corp.'s (AHS) now highly imitated distribution system. For the first time, hospital personnel could place orders directly with AHS by using a keyboard and terminal located at the hospital.

The AHS system greatly increased customer satisfaction as the hospital had more control over its orders. It also substantially decreased the number of data entry operators AHS needed to employ.

Look for the positive

Both Competitive Technologies and Synectics emphasize the importance of positive responses in order to facilitate creative thinking, Cunningham says. During meetings, participants must state something they like about an idea before they can elaborate on any bad aspects. Even if the idea or experiment proves relatively fruitless, it is not necessarily bad. Someone once told Thomas Edison that it seemed a shame for the inventor to do so

much work for nothing. Edison disagreed: "It's not for nothing... Now we know 700 things that won't work."

In order to find elements that do work, a company must "plan and prioritize," Baxter's Heschel says. "The AHS system was an evolving program. The whole thing started in the early '70s, but it wasn't a good competitive product until the late '70s."

Spalding's White also says he believes in the power of planning. "The corporation puts out a rolling, three-year strategic plan. As soon as we have that, we devise a rolling, three-year MIS plan that encompasses the strategic goals," he says, adding, "This year we're putting together a giant customer service system."

Spalding's Mason notes that some ideas for the system are generated "by non-MIS people who chair these user groups. We have project managers who meet with these people on a weekly basis to determine needs and solve problems."

Arco also encourages its users to contribute brainpower, but it has not devised a formalized system. "We don't plan a conference with end users every fourth Thursday, but sure, we listen to what they have to say," Smith says.

Ironically, it was the act of not listening that enabled Masaru Ibuka, honorary chairman of Sony Corp., to develop an outstanding idea. One day, while looking through company laboratories and poking through pending research projects, he came across a lightweight pair of headphones. A few minutes later, he encountered a miniaturized recorder.

He asked engineers to combine and modify the two in order to produce a portable stereo system. His engineers claimed it would never sell. Two years later, the Walkman ran up record sales for Sony.

Remember, Ibuka did not work in the lab. But his position gave him a different view of the entire process. Sometimes, those doing the experimenting or brainstorming do not have the proper perspective on a given situation, creativity consultant Cunningham says. "We have invited representative customers and suppliers to sessions in order

to reinforce the external experience. This is where the client really gains the advantage," he notes.

Close to the customer

Customers, in fact, constitute one of Baxter's primary idea sources. "We go out to our customers' operations, take tours and discuss their problems," Heschel says. Although this interaction is crucial, he says he does not believe it's enough. "We also belong to the Center for Information Systems Research at MIT. We've received some good ideas from them."

Spalding also makes use of university sources. "We work



Arco's Smith

closely with the University of Massachusetts. Their information systems department has student interns come in and review our long-range MIS plans. Students ask some tough but fundamental questions," White says, adding, "MIS professionals tend to make a lot of assumptions. Students test you and make sure your answers are sound."

Regardless of where they get their ideas, many inventors will tell you their products are merely a recombining of known bits of information. Birds flew before airplanes, and bats used radar before the military. Although counting on fingers preceded the computer, a lot of brainstorming occurred before the gap was bridged. Undoubtedly, as information systems continues to develop, especially in the area of artificial intelligence, more and more MIS professionals will have to give a great deal of thought as to how they think.

Davis is a research analyst with Information Data Search, Inc. in Cambridge, Mass.

The Big One

FROM PAGE 75

"The main reason for the move is to give us more space," said Woodson M. Hobbs, former executive vice-president of information systems and now an internal consultant. "Once we decided we needed more space, we wanted to move far enough away from the fault lines so we wouldn't be part of it all."

In most cases, however, it is

not cost-effective to run a corporate DP center in a separate part of the state, and such a practice can create a greater division between users and MIS, according to Kenneth Myers, president of K. N. Myers & Associates, disaster recovery consultants in Pittsburgh.

"The most cost-effective solutions to continuation lie in working directly with the users, finding out how they will survive in the absence of DP support as opposed to going to an exotic

hot-site plan," Myers said.

The electrical fire in Chicago in May that severely crippled telecommunications [CW, May 16] dramatized the fact that while many companies do have some sort of DP disaster plan, few have considered the need for alternative telephone switching systems.

"Only one in a hundred companies has an alternate communications plan in case of an emergency," said Raymond Epich, vice-president of The Diebold

Group, Inc. in New York.

Such a plan could be as basic as walkie-talkies for in-house communications or placing backup telephone switching systems off-site.

Unlike other disasters, even a modest earthquake can bring down an unprepared DP center for days. If any structural damage has occurred to a building, for example, local authorities must declare it safe to enter again. That process, if there are enough buildings requiring at-

tention, could keep users from getting back to their terminals as long as one week.

Overall, the primary concern after a killer quake is not the machinery but the employees.

"Your staff is always your greatest resource," said the MIS manager of a Southern California-based banking conglomerate, "and the first plan of action should be to adopt a solid emergency escape drill. Then you deal with how you're going to do business."

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Old and new

FROM PAGE 75

- Brought stability and cost control to an MIS organization that had been racked by a radical effort to modernize after years of neglect.
- Initiated a decentralization that transferred control of much of his organization to line business units.
- Defended his already restrained budget to an executive committee contemplating a 20% spending cut.
- Helped change business processes in conjunction with automation and examined the concept of a "lights-out" data center.

Born leader

Frank Sullivan, the Mutual Benefit vice-chairman to whom McCaig reported until Sullivan's retirement June 30, says McCaig transcends the role of technician with "pure leadership ability" and a capacity for inspiring trust.

"It really came down to an element of trust," Sullivan says of McCaig's promotion from manager of technical services to information systems chief. "We felt McCaig knew what he was doing and that he and his asso-

ciates could make it happen."

Those associates and colleagues outside the company point to McCaig's knowledge and ability to make things happen. They describe McCaig as a visionary with a knack for imparting his vision to others.

"He has the ability to absorb a tremendous amount of information and, out of it, create something uniquely fit to Mutual Benefit Life," says June Marrero, the company's vice-president of individual insurance systems.

McCaig is a good listener, knows MIS technology and the needs of his company and is "really able to lay it out to his people," says Jack Forster, former head of MIS at Ingersoll-Rand Co. and now a consultant working with Mutual Benefit.

Paul Himmelsbach, manager of the information services plans and controls department at Mutual Benefit, emphasizes McCaig's development of teamwork. "Chuck has built a management team that everyone feels responsible for. We, the heads of all the areas, feel accountable to be sure problems [elsewhere] are solved. We help our brothers and sisters, so to speak," Himmelsbach added that this approach reflects a concern for customer service.

But it is not all wine and roses

to work for McCaig. While he's fair, he's tough, Himmelsbach says. "He expects a lot from you. He doesn't come out and throw bouquets all over the place. You get it once a year or every two years. Then you know you've done a great job."

McCaig was born in Brooklyn, N.Y., and raised in northern New Jersey. He holds a bachelor's degree in philosophy and an MBA from Fairleigh Dickinson University and worked as a customer service supervisor at Sylvania Electric Products, Inc. before joining Mutual Benefit as a programmer in 1966.

Knows the basics

As Sullivan notes, McCaig maintains a low-key style despite his charisma as a public speaker. In his plainspoken manner, he is quick to stand by his grounding in the bits and bytes of MIS.

"I have always had and still have a real fascination for the computer technology itself," he says, noting that many people today consider such enthusiasm a bad trait in a manager. "I guess if that's the only thing you are, then it's a bad thing," he says. But McCaig wonders whether companies that install top MIS managers lacking technical backgrounds risk losing operational performance. "There are

so many choices that can be made today on just the technology side."

Mutual Benefit observers divide the company's recent MIS history into three periods: a "quiet era" of limited MIS budgets and second-generation systems that lasted through 1976, followed by an effort to make up for neglect and, finally, McCaig's tenure. Marrero describes McCaig's initial role as "bringing order from chaos and turning systems into something as reliable as the electric company."

A major thrust of McCaig's efforts has been a decentralization of systems to business units; "a lesser person might have concluded that the best thing to do was preserve turf," Sullivan says.

Mutual Benefit's large centralized MIS organization enhanced internal performance but hurt relationships with business units and, thus, the bottom line, McCaig says. He opted to give the line units more control over their destinies because they are responsible for the company's bottom line, he says, even though some MIS people felt they were "giving away the crown jewels."

McCaig faced a major challenge when Mutual Benefit's executive committee, prompted by

Sullivan, proposed cutting the systems budget by 20%. McCaig won six months to prepare a response and put on a presentation that turned the committee around. His pitch emphasized that much of the spending for applications development should be regarded as capital investment, like major hardware purchases. "I think it was the first time they saw the money we spend developing systems is really just like buying an asset," McCaig says.

Turning to the future, McCaig is in the midst of helping revamp the processing of applications for Mutual Benefit insurance policies to take advantage of new technology. A process that had required 130 steps on the part of 70 clerks has been reduced to 90 steps with an eye toward completing it with a handful of professional workers.

McCaig is ready to move on a just-completed study of state-of-the-art data center technology and management. It recommends slashing the number of job titles for the main data center from 29 to three and its work force from 119 to 72. McCaig says he restated the goal of the effort as a state-of-the-art data center after the expression lights-out failed to engender enthusiasm among the staff.

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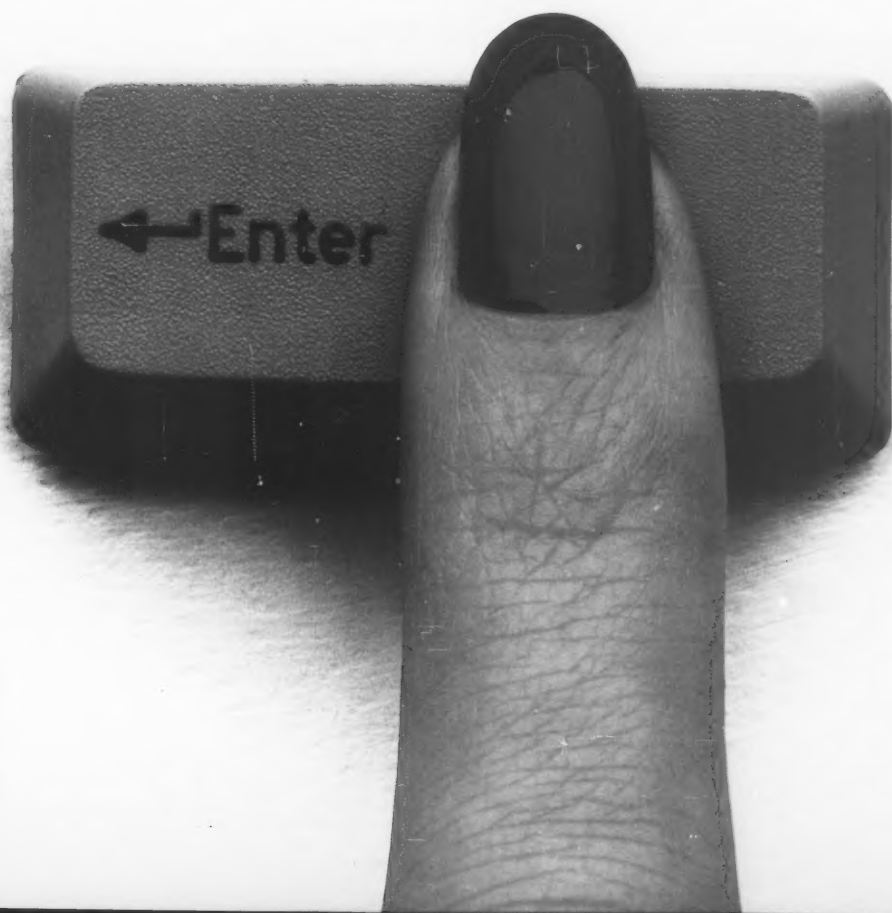
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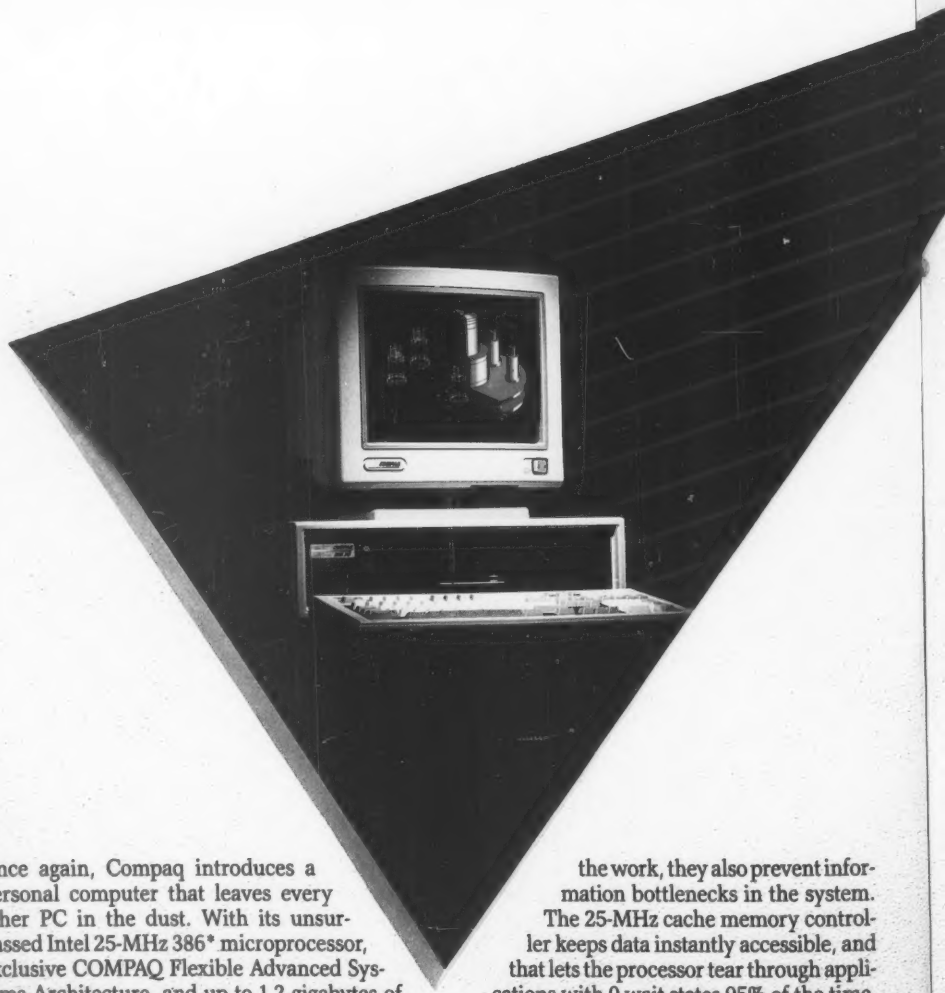


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COMPUTER INDUSTRY

INDUSTRY INSIGHT

James A. Martin

HP no wimp on the beach



And you thought Hewlett-Packard was the Wally Cox of the computer industry.

Meek, mild, good old HP, you thought. Solid company, solid products. Beloved by loyal customers, admired by competitors but never feared. Dependable old HP. It sticks to its business, keeps quiet and doesn't give anyone any trouble.

But be realistic. This is the Iron Man '80s, the reign of Rambo — and even the Wally Coxes of the world are sporting a little bicep underneath their white lab coats.

HP has been busy building a new body these days — a new reputation. Tired of the mild-mannered image, the Palo Alto, Calif.-based company has spent the last year learning how to walk tall and talk tough.

The first clue

It started with all that business about Spectrum. HP took it on the chin for at least two years about its risky reduced instruction set computing (RISC)-based minicomputers, from the time Spectrum was first mentioned ("It'll never work!") to the time the hardware was rolled out one year late ("It's about time!").

Now that HP's RISC machines are in place and the reviews are good, the company has gained confidence. The sales and marketing forces are

Continued on page 86

Overseas sales float U.S. industry's boat

BY JAMES DALY
CW STAFF

Vendors looked across the oceans for foreign markets to buoy domestic profit margins squeezed by the dynamic random-access memory (DRAM) chip shortage, according to financial results released last week detailing the second quarter ended June 30.

Overseas sales helped spur continued strong performances by Apple Computer, Inc., Amdahl Corp. and NCR Corp. and a resurgence by Storage Technology Corp. Results were also strong at Computer Associates

International, Inc., but Lotus Development Corp.'s sales growth slowed to 6%, and the microcomputer spreadsheet leader warned of trouble ahead in the third quarter. Tandem Computers, Inc. reported a 33% drop in profits, in part because of delays in shipping larger configurations of the Nonstop CLX computer.

Companies reporting results last week included the following:

Apple. International sales that accounted for nearly 40% of total sales and a strong demand for the Macintosh II helped Apple keep revenue and net income

Continued on page 87

1988 second-quarter earnings

Chip shortages squeezed some vendors' profits, but recoveries are well under way at MCI, Computer Task Group and VM Software

	Revenue April through June (in millions)	Percent change from 1987	Net income April through June (in millions)	Percent change from 1987
Amdahl	\$423.8	24	\$53.8	74
Apple	\$993.1	56	\$91.3	71
Archive	\$31.9	31	\$2.8	40
Computer Task Group	\$54.1	32	\$1.7	46
Convergent	\$106.7	15	\$2.1	425
Duquesne Systems	\$12	32	\$2.5	36
Excelan ¹	\$15.3	66	\$1.2	25
Intergraph	\$203.5	27	\$23.4	39
Lotus	\$122.1	30	\$17.3	6
MCI Communications ²	\$1.29B	28	\$73	813
NCR	\$1.49B	10	\$112.4	14
Paradyne ³	\$58.3	1	(\$2.9) ⁴	—
Seagate Technology	\$368.4	47	\$16.5	(56) ⁴
Software Publishing	\$20.1	141	\$3.9	338
VM Software	\$10.6	56	\$1.3	1,033

¹ One-time charge of \$162,000 related to termination of member agreement with Network Equipment Technologies

² Includes pretax gain of \$9 million from previously negotiated antitrust settlement

³ Reported a loss of \$1.5 million in 1987

⁴ Parentheses indicate decrease or loss

CW CHART

NCR reaches for sky

Growth plan moves from MIS to end-user needs

BY JEAN S. BOZMAN
CW STAFF

DAYTON, Ohio — By moving away from the glass house of MIS toward the processing power on the end user's desk, NCR Corp. hopes to double in size and surpass the \$10 billion revenue mark sometime in the 1990s.

"There was a point in time when, in order to process a lot of data, you had to bring it to the glass house," NCR President Gilbert P. Williamson said in a recent interview at NCR corporate headquarters here.

"The new wave of data processing, however, puts a lot of computing power at the end user's fingertips. It is a fundamental change, and that's why we're spending most of our time on distributed processing," Williamson said.

Williamson did not mean that NCR will neglect its 8000 series mainframes. In fact, there are new mainframe and high-end NCR 9800 products scheduled for announcement in the next 12 months. But the newly named

president said he does not expect the growth to be in the mainframe sector.

Instead, NCR executives plan to get a slice of each information processing pie, including semi-conductors, board-level products, personal computers, minicomputers and networking hardware and software. These products are likely to show up at a bank's automated teller machine, a fast-food chain's point-of-sale terminal or a retail store's remote operations.

Like a surfer anticipating the next wave, NCR believes it is positioning itself now to take advantage of the wave of distributed processing that is just beginning to crest.

"The bulk of what is being
Continued on page 84

Inside

- Saxpy pares down in preparation for acquisition. Page 82.
- 3Com targets 40% annual growth by 1991. Page 83.



Williamson and Exley focus on end-user power

GTE lessens holdings in U.S. Sprint

BY ELISABETH HORWITT
CW STAFF

KANSAS CITY, Mo. — Citing the need for more efficient management in a competitive market, United Telecommunications, Inc. and GTE Corp. announced last week an agreement to end their 50-50 ownership of U.S. Sprint Communications Co., the third largest U.S. long-distance carrier.

United Telecom will assume a controlling interest in the firm

by purchasing 31.1% of GTE's stake at an estimated book value of \$600 million and will take over all day-to-day management responsibilities, the company said. GTE will remain a limited partner with an option to sell its remaining 19.9% stake to United Telecom by the end of 1995.

Also announced was the resignation of Sprint President Robert Snedaker.

Analysts attributed the changes to Sprint's continued failure to make a profit.

"The cynic's view is that GTE said, 'We've fooled around two years, let's kiss it good-bye while we're still solvent,'" said John Bain, senior vice-president at Shearson Lehman Hutton, Inc.

Cash evader

While Sprint has had 35% to 40% annual growth rates and also enjoyed a healthy 7% share in minutes of use in the long-distance market last year, "it's just not good at making money,"

Bain commented.

Net losses during the last two years have been a result of a combination of rising access charges, customer discounts, the need to lease bandwidth from other carriers while Sprint's fiber-optic network was being installed and uncollectible charges that totaled \$305.5 million in 1987, according to Bain.

While the two partners felt that a 50-50 ownership arrangement "was important to get Sprint launched successfully," limiting management to one company "will enable U.S. Sprint to be more responsive to

the dynamics of the marketplace and the growth stage they're in," said United Telecom's Vice-President of Corporate Communications Donald Forsythe. The company had been interested in acquiring a larger share of Sprint for some time, he added.

"When you sell a company that is losing money, one can only assume that this is cutting losses, but the primary reason for the transaction was management," said GTE spokeswoman Janet Weatherbee.

United Telecom will take the controlling interest because, as a

Continued on page 86

Saxpy erects For Sale sign

BY JULIE PITTA
CW STAFF

SUNNYVALE, Calif. — Saxpy Computer Corp., which gained national attention when a former employee was arrested last fall for attempting to sell company secrets to the Soviet Union, has put itself up for sale and will liquidate in 30 days if no buyer is found.

According to Saxpy President Tony Yates, the supercomputer start-up has pared down operations in preparation for an acquisition. Saxpy's work force has been reduced to 13 from an original 41 employees. All that remain are Yates and

Saxpy's hardware and software development team, since they would be "key to transferring the technology to someone else," Yates said.

The asking price for Saxpy remains undisclosed. Yates said Saxpy is in negotiations with three potential buyers and anticipates that an agreement will be reached with one of those suitors within 30 days. If an agreement cannot be reached, Saxpy will quietly liquidate, Yates said.

Saxpy began to hit on hard times last fall when the company sought mezzanine financing. The erratic behavior of the stock market quashed plans for a second

round of outside financing.

The cash-strapped company then sought additional financing from its current investors. As that investment was being arranged, then-Saxpy President Howard Thrailkill left the company for a position at Floating Point Systems, Inc.

As a result of Thrailkill's departure, several investors dropped plans to reinvest. Saxpy eventually received \$2.2 million, which was significantly less than originally expected.

Last November, former Saxpy software engineer Ivan Batinic was arrested by the Federal Bureau of Investigation on conspiracy charges. The FBI believed Batinic was a key person in a conspiracy to sell Saxpy's computer technology to the Soviet Union. The case is still pending.

IN BRIEF

Codex woes

Motorola, Inc.'s data communications subsidiary Codex Corp. announced its first significant layoffs in 18 years, cutting its worldwide work force by 280 employees, or 6%. The cuts will help the Canton, Mass., firm retrench after an overly aggressive 1988 growth plan, which has been hampered by a market downturn and lower margins in Codex's core modem business.

Today, the world

UK micro clone maker Amstrad PLC signed a cross-licensing agreement with IBM. The deal will allow Amstrad to sell Personal Computer and Personal System/2-compatible systems worldwide.

On the warpath

No one expected Perot Systems Corp. founder H. Ross Perot to walk away quietly after Electronic Data Systems Corp. (EDS) and Planning Research Corp. successfully challenged his recent U.S. Postal Service contract. Perot has struck back at EDS, saying Perot Systems will bid on a lucrative Medicaid processing contract for the Texas Department of Human Services. The contract has gone to EDS for the past 11 years and has not gone out to bid for six years.

OSF in Europe

The Open Software Foundation (OSF) consortium will open a European headquarters in Brussels under the direction of Henning Oldenburg. Oldenburg is currently computer-integrated manufacturing sales manager for OSF member Nixdorf Computer AG.

Going public

The Securities and Exchange Commission will be kept busy going over a deskful of initial public offering filings in the computer industry. Mountain View, Calif., local-area network manufacturer Synoptics Communications, Inc. hopes to put 1.5 million shares on the block for between \$11 and \$13 a share, while retailing giant Computerland Corp. has proposed a five-million-share initial offering; Sugar Land, Texas-based BMC Software, Inc. would like to put three million shares up for sale.

New entity

Logica PLC, a UK software and systems firm, has merged its U.S. operations with Waltham, Mass.-based Data Architects, Inc., which Logica bought in March. The new firm will be called Logica Data Architects, Inc. and serve the high-end software and systems market.

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3Com aims for 40% growth

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — Network vendor 3Com Corp. is gunning for a big growth spurt and has enacted at least one tough measure to show it means business.

Speaking to a gathering of financial analysts recently, 3Com Chairman William Krause said the firm is targeting a minimum of 40% annual growth by fiscal 1991. Anything less will kill executive bonuses, he said. "They are really serious about this, very bullish, and they really want to achieve more than 40% growth,"

said Joseph Seidler, an analyst at Infonetics, Inc. in Santa Clara, Calif.

He added that Krause cited figures from Dataquest, Inc. and International Data Corp., two market researchers, that estimate the average network industry growth at between 40% and 45%.

Great expectations

3Com, which is in the first quarter of its fiscal 1989, also expects to achieve a minimum of \$1.18 per share, or a 30% growth in earnings over last year, for the next fiscal year.

At its most optimistic, 3Com sees po-

tential for as much as a 50% increase in earnings and a 60% increase in growth, Seidler said. "They want to grow faster than the industry average in total."

Krause said the firm will have to grow as fast as Sun Microsystems, Inc., Novell, Inc. and Digital Communications Associates, Inc. 3Com also repeated its oft-stated objective to become the first billion-dollar communications company. The company wants to retain its leadership in Ethernet adapter sales while building a world-class major accounts sales force, which will target large organizations with multivendor systems. It also hopes to double the number of units of software sold during this fiscal year, which began June 1.

Krause also outlined the company's

targeted changes in revenue contributions from different areas. Major accounts will almost triple, spiraling from their current 26% of 3Com's revenue to 60% by fiscal year 1991. Reflecting that growing emphasis on major accounts, reseller sales will plunge from 57% today to 30%.

Krause also said revenue from workstations, servers and software will nearly double, rising from 26% to 46%. Transmission products such as adapter cards will go in the opposite direction, dropping from 40% of 3Com's revenue to 25%.

Addressing the current dynamic random-access memory chip shortage, Krause told analysts that 3Com is in the process of negotiating some long-term supplies for 256K chips and is looking to stabilize its margins, Kimball said.

Datagate's HP suit dismissed

BY JAMES A. MARTIN
CW STAFF

SAN JOSE, Calif. — In what was described as a setback for third-party computer maintenance companies, a U.S. District Court judge here has dismissed a 2-year-old antitrust lawsuit filed by Datagate, Inc. against Hewlett-Packard Co.

In its suit, Milpitas, Calif.-based maintenance firm Datagate claimed HP violated antitrust laws in its dealings with Datagate and other third-party maintenance firms during the last five years.

Datagate's suit, filed in February 1986, sought some \$35 million in damages from HP and charged the Palo Alto, Calif.-based company with unfairly restricting Datagate's access to HP parts. The suit also claimed HP used its position to restrict competition in the market for maintaining HP computers. The judge ruled, however, that Datagate failed to substantiate its claims. Datagate attorneys were not available for comment.

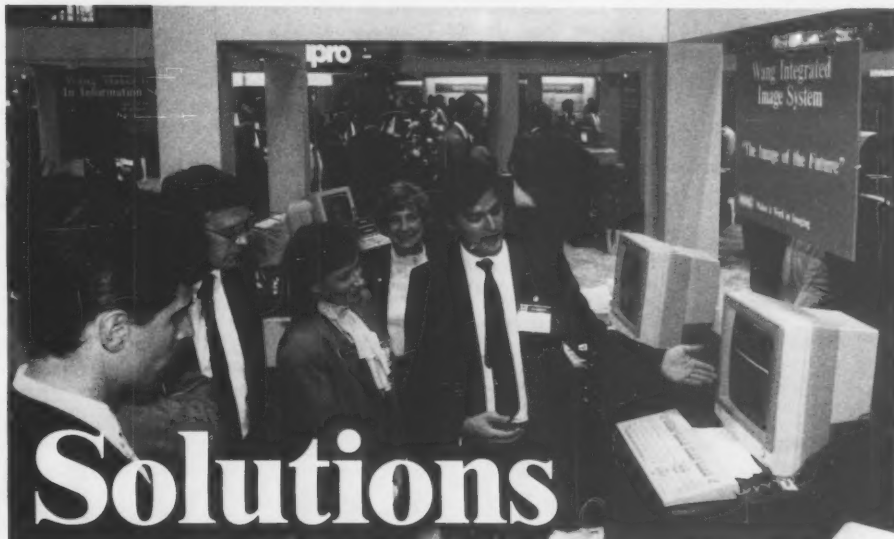
Third-party defeat

Datagate's suit was one of the first legal cases to test the controversial issue of vendor cooperation with third-party firms. Its dismissal could "make it harder for third-party and smaller maintenance companies to compete in the industry," said Richard Intile, vice-president of Computer Maintenance Corp. in East Rutherford, N.J., and chairman emeritus of National Computer Services Network, an industry trade association.

"The vendors now know they have the upper hand" as a result of the Datagate lawsuit dismissal, Intile said, "and that the federal government is behind them."

The third-party maintenance industry has found it increasingly difficult to compete against large systems vendors, Intile said. "Some manufacturers won't sell you parts at any discount, and make you wait such a long time for those parts that it's impossible to compete. They make documentation totally unavailable, and training you have to get on your own."

Some third-party maintenance firms are scoring a few points in the courts, however. Last May, for example, an appeals court in Cincinnati ruled that HP must abide by a lower court's injunction ordering HP to provide service calls to Hypoint Technology Co. [CW, May 16].



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xx

NCR

FROM PAGE 81

used to do data processing today is dumb terminals that are connected remotely to some big box," said NCR Chairman and Chief Executive Officer Charles E. Exley Jr. "That's yesterday's solution. Those kinds of terminals are being replaced by intelligent workstations, and that remote box is being replaced by distributed processors that are more cost-effective than the mainframe."

Big slices

NCR's two lines of transaction processors — the NCR 9800, for large on-line applications, and the NCR 10000 system, for smaller interactive users such as regional banks — account for a large slice of NCR's sales. These products are sold directly into end-user accounts. Another slice comes from such telecommunications products as NCR Comten's 5660, which is often used as a front end for IBM Systems Network Architecture (SNA) computer rooms.

NCR's Microelectronics Division is a freestanding semiconductor business; it sells small computer systems interface boards and application-specific

integrated circuit boards to other systems suppliers. Just 20% of the semiconductor division's output goes into NCR's own products.

"It's a kind of insurance poli-

cy to have a semiconductor division," Exley conceded, "but it is not a captive supplier. Eighty percent of its products go to other suppliers — not to us."

The company's Personal

Computer Division is also outward-oriented; it is as interested in providing board-level products to other computer vendors as it is in building and selling its own IBM Personal Computer

and Personal System/2-compatible products.

A new focus, according to Personal Computer Division Vice-President Vernon W. Yates, is building high-powered

Talking with the men at the top

Computerworld Midwest Bureau Chief Jean S. Bozman spoke with NCR President Gilbert P. Williamson and Chairman and CEO Charles E. Exley Jr.

Why does NCR seem to be so low-profit for a \$5 billion computer vendor?

Williamson: Our products aren't just sold through our direct marketing organization, as you would classically think of an information company as doing. So our company isn't often seen as a supplier of technology, because that technology shows up with somebody else's label on it, or it's invisible inside their box.

How important is transaction processing to your product strategy?

Williamson: If you take transaction processing in its broad-

est definition, the overwhelming majority of what we sell and install today is in the transaction-processing segment.

How is your business benefiting from the trend toward open systems architecture?

Williamson: The idea that you have to provide all of the applications software yourself is an old idea. Most software today is provided by specialists, or by the end-user companies themselves. The open systems idea is making that more prevalent.

A third party can develop an application under Unix that is portable across a hundred [hardware] products. The open systems concept helps us incorporate value from a lot of sources and not spend our development dollar redoing the same thing. The only fear we would have is not of open sys-

tems — it would be that we're not creating value.

What do you think of the Open Software Foundation (OSF) group that is promoting a separate Unix standard?

Exley: Our position on it will depend on the degree of compatibility with Unix that the product has. The thing that is important is that it [the OSF movement] does represent a recognition of the power of the idea of open systems.

But that's a carol we've been singing for quite a few years. I think we can legitimately claim to be a pioneer in pushing the concept of open systems.

NCR sales worldwide are growing at a higher rate than in the U.S. Is there a different data processing

requirement abroad?

Williamson: I don't think there's a huge difference in application technology around the world. We've installed state-of-the-art on-line banking systems in both Egypt and Malaysia, for example. You find that leading firms around the world are installing state-of-the-art systems, no matter where they might be located.

Do you have any concerns about being taken over?

Exley: I would have to say that I have no comment on that.

Is there anything that you can do to fend off such an attempted takeover, should one occur?

Exley: We really can't speculate on that. But, if you look around, there have been successful defenses.

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EXECUTIVE CORNER

workstations for the fast-growing engineering/scientific and computer-aided design and manufacturing markets. But one-third of all division products are sold through OEMs, Yates said.

"One of the principles we pursue is, we want to conduct our business at every level of the market," Exley said. "We sell the NCR Tower to other manufacturers under OEM agreements, and we also sell it to customers who are, in effect, their own system integrators. In other cases, the Towers are sold with applications provided by third parties — and we sell our Tower system as part of an NCR retail system."

NCR's traditional outlet as an OEM supplier has contributed to its low-profile image, Williamson admitted. Many of NCR's products arrive at end-user sites with some other company's label. For example, Unisys Corp. resells NCR's Tower supermicro for some vertical applications.

Fueled by this strategy, the firm's financial results are undeniably strong. NCR's second-quarter results, announced last week, continued its recent string of consistent earnings and revenue growth (see story page 81).

Most of the company's financial indicators point up — and have done so quarter after quar-

ter. And while NCR's U.S. sales grew less than 7% during the last three years, its international sales grew 26% in 1986 alone. International sales account for more than 50% of total revenue — but NCR also benefits from currency exchange rates, because it exports most of its products from U.S. factories.

Our motto is . . .

If there is a watchword for NCR's success, it is the phrase oft-repeated at NCR facilities worldwide: "stakeholder." Exley's stakeholder philosophy, underscored in name by the department of Stakeholder Relations at NCR headquarters, holds that the days of proprietary systems are over. To do well in the new environment, vendors come to view potential competitors as potential business partners.

"The focus has to be on bringing more value to attract customers to use your technology," Williamson said. "So the idea that a product has to be pure NCR or pure Brand X is an idea of the past, because that thought is based on the idea that there's only one source of technology."

The drive toward open systems, evidenced by standards like Open Systems Interconnect, Manufacturing Automation Protocol/Technical and Office Pro-

tol and X/Open, will let users choose systems on the basis of features — not brand labels.

"There are thousands of innovative people creating value," Williamson said. "The open systems concept helps us incorporate value from a lot of sources. That way, we won't spend our development dollars reinventing the same thing."

NCR has stayed on the sidelines in the recent debate about the Open Software Federation Unix standard. But Exley said the firm will continue to back the Unix standard in general because it lends portability to the applications developed under it.

Exley predicted that if NCR's ship stays on course, the company will surpass the \$10 billion annual revenue mark by the year 2000. But he feels it is a safe prediction — since he must retire by 1995. "Everyone must step down as an officer of the company at age 65," he explained.

Asked if he might retire before that deadline, Exley said he has thought about boarding another ship — this time a sailboat — and sailing around the world. "It could be that I'll retire before then, because I figure that it'll take me about 10 years to sail around the world," he mused. "I may not make it, but the important thing is to start out."

Lotus Development Corp. announced the appointment of **Bruce Johnston** as director of Corporate Business Development.

Johnston comes to Lotus from First Boston Corp. in New York, where he was assistant vice-president in the Equity Research Department. Johnston will report to Robert Schechter, senior vice-president for Finance and Operations, and will be responsible for corporate business development, strategic business planning and research of new markets.

Ashton-Tate Corp. announced the appointment of **Terence J. Garnett** as vice-president and general manager of its Macintosh Software Division. Garnett comes to Ashton-Tate from Reliance Holdings, Inc., where he was responsible for investigation of high-technology investment opportunities.

Paradyne Corp. reported that **John J. Mitcham** has been named president, chief executive officer and a member of its board of directors.

Prior to joining Paradyne, Mitcham was assistant general

manager of operations at IBM's Communication Systems Division. Mitcham was employed by Texas Instruments, Inc. from 1965 to 1982.

TRW, Inc. announced that **Tom Ewing** has been named vice-president of operations of TRW's Customer Service Division.

Ewing will be responsible for the entire field service organization. Prior to joining TRW, Ewing managed the Great Lakes Region of IBM's National Service Division, located in the Detroit area.

Fujitsu America, Inc. announced that its President and CEO **Masaka Ogi** has been named president of **Fujitsu Laboratories Ltd.** Fujitsu Laboratories is the premier research institute of Fujitsu Ltd. **Yasushi Nakamura** succeeds Ogi as president and CEO of Fujitsu America.

Softech, Inc. made public the resignation of **Jorge E. Rodriguez**, senior vice-president. Rodriguez, one of the founders of Softech and a director, will leave to start his own business.

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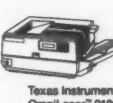
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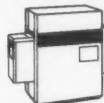
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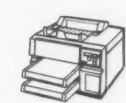
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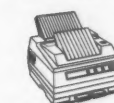
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Martin

CONTINUED FROM PAGE 81

charging out into the field armed with car phones and benchmarks, ready to seduce new customers from among the DEC and IBM loyals.

The new-found HP confidence is even beginning to bloom into boastfulness. "Every day, Hewlett-Packard helps IBM, DEC and Sun realize their true potential," read a full-page advertisement in *The Wall Street Journal* earlier this summer.

Now, there's the infamous Apple lawsuit, in which Apple sued HP and Microsoft, claiming HP's New Wave and Microsoft's Windows graphical user interface environments are too similar to the Macintosh.

Perhaps with that lawsuit, Apple figured it was still dealing with Wally Cox. But after receiving HP's countersuit — even *The Wall Street Journal* said it was "sharply worded" — Apple must now realize that the one-time 98-pound weakling is not about to take any sand in the face.

Greatest hits

Sample, if you will, a few of the countersuit's greatest hits:

- HP claims that Apple procured its Macintosh user interface copyrights "through fraud and/or inequitable conduct practiced upon the U.S. Copyright Office." Indeed, according to HP, Apple knowingly misrepresented or concealed facts from the copyright office regarding "the lack of originality and derivative nature" of its interface, which in fact "had been created and developed by others, including Xerox Corp."

Therefore, HP maintained, Apple's copyrights are unenforceable.

- HP has "long planned to enter this market with its New Wave interface system, a major advance over Apple's system in terms of functionality and performance capabilities."

Because New Wave is Apple's first

LIKE THE SCRAWNY Wally Cox-type nerd who finally stands up for himself, HP is coming into its own and is clearly enjoying it.

"serious threat," the suit claimed, "Apple's bad-faith sham filing and its bad-faith sham prosecution of the present infringement suit against HP are calculated to stall and defeat and have already stalled and impaired New Wave's entry into the market."

- The user community has been "adversely affected" by Apple's lawsuit because it enabled Apple to "charge higher prices than would otherwise prevail in a competitive market."

On top of that, the lawsuit and the ensuing Apple Macintosh monopoly have "deprived users of the benefits obtainable from HP's superior New Wave systems."

Touche for HP. One expects a countersuit to bargain from a position of strength, yet it's refreshing to see HP stand up and get downright nasty when challenged.

That last statement, however — the one about depriving all those poor users of

the superior New Wave — goes beyond bold into the realm of bombastic. Despite New Wave's strong selling points, the assertion is laughable — a mere marketing-minded response to the more serious questions of intellectual property and copyrights that are facing the computer industry.

Like the scrawny Wally Cox-type nerd who finally stands up for himself, HP is coming into its own and is clearly enjoying it. In the process of learning how to walk tall and talk tough, however, HP executives and attorneys have not necessarily learned how to shoot straight.

But at least they're shooting.

Martin is a *Computerworld* West Coast senior correspondent.

GTE

CONTINUED FROM PAGE 81

much smaller company than GTE, Sprint's financials "are more material to their bottom line," she added. GTE has more than \$14 billion in annual revenue.

GTE is selling its share at a bargain price, considering that the firm is getting back approximately half of the money it has spent on Sprint since the venture was formed in 1986, Bain said. A company such as Sprint typically trades at three to four times its book value, he added.

On the other hand, United Telecom has "bet the farm on this thing; it will be either a major success story or a disaster," depending on whether the company can turn Sprint around during the next few years, Bain said.

Sprint's Snedaker is leaving to take early retirement as of Aug. 15. "With the pending change in ownership, it's an opportune time to identify new leadership for U.S. Sprint," he said in a prepared statement.

United Telecom President and Chief Executive Officer William T. Esrey will take over Snedaker's responsibilities on an interim basis until a new president is appointed, the company said.

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Overseas sales

CONTINUED FROM PAGE 81

growth strong. Earnings per share for the Cupertino, Calif., manufacturer also grew to 70 cents, a 78% jump over last year's figure of 40 cents per share.

"Their international push has really paid off," said Wendy Abramowitz, an analyst at Argus Research Corp. "Their results were higher than our projections, and that's because international sales are growing and becoming a very strong financial factor. And they're still growing at a significant rate overseas."

Lotus. On the other side of the country, Cambridge, Mass.-based Lotus experienced difficulty pushing up sales for its

second quarter. The firm also cautioned that third-quarter results may be hit by investment in the delayed launch of 1-2-3 Release 3, which was supposed to ship in the first half of the year but is now scheduled for a fourth quarter release.

Despite the sales slowdown, most analysts agreed that the slow growth represented a temporary dry spot in the road for the software giant. "The party is definitely not over at Lotus," said Steven B. Frankel of Adams Harkness & Hill, Inc. "They were a bit disappointing, but I think what we're seeing is simply a little bit of growing pains related to a transitional period."

Amdahl. A new series of central processors helped the Sunnyvale, Calif., vendor continue to roll along, recording good

revenue and net income gains while earnings per share jumped 40% to \$1.

NCR. Strong sales in the European market and a strengthening U.S. dollar helped buoy quarterly receipts for the Dayton, Ohio, manufacturer. Earnings per share also rose 30% in the quarter to \$1.36 per share.

Tandem. Robust overseas sales for the Cupertino fault-tolerant systems maker were not enough to offset a domestic shortfall made worse by a delay in a major release of systems software. President James G. Treybig said the company's 27% revenue growth was "less than we had forecast for this historically strong quarter," causing net income to drop. Revenue was \$339 million, up from \$267.9 million for the same period last

year, and net income logged in at \$17.3 million, or 18 cents a share, down from \$25.9 million, or 26 cents per share, reported for the same quarter in 1987.

Alliant Computer Systems Corp. As expected, the minisupercomputer maker reported its first operating loss since delivering products. President Ronald H. Gruner blamed tough North American sales and a one-time charge of \$5.4 million associated with the acquisition of Raster Technologies, Inc. with the quarter's net loss of \$8.6 million, down from a profit of \$2 million reported for the same period last year.

The Littleton, Mass., firm reported quarterly revenue of \$14.2 million, a dip from the \$18.7 million notched for the same period a year ago.

Computer Associates. Despite having its takeover bid for Management Science America, Inc. rejected, the Garden City, N.Y., systems software giant had little to cry about. In its first fiscal quarter, the firm saw profits soar 83% to \$16.9 million or 21 cents per share. Sales climbed 33% to \$185.7 million.

Electronic Data Systems Corp. The firm managed a 33% jump in profits on virtually no increase in sales compared with the year-earlier quarter. The Dallas-based services giant earned \$72 million, or 78 cents per share, on revenue that eked out 1% growth to \$1.2 billion.

Data General Corp. The Westboro, Mass., minicomputer maker continued its climb out of last year's financial hole as both quarterly revenue and net income squeaked up. Revenue for the quarter came in at \$330.7 million, a 6% increase over the \$313.6 million reported for the same period last year. Net income was \$1.9 million, or 6 cents a share, compared with a loss of \$65.1 million, or \$2.40 a share, reported last year.

Despite the gains, President Edson de Castro said "We are disappointed with the level of revenue generated in the current quarter."

Storage Technology. Despite what it termed disappointing order rates in the U.S., Storage Technology rode strong overseas business to a 16% quarterly revenue growth, or \$203.3 million. Income from continuing operations was \$7.1 million, or 3 cents per share, compared with an operating loss of \$3.4 million, or 1 cent per share, one year earlier.

But Chairman Ryal R. Poppa warned that longer-than-expected sales cycles for the 4400 tape library may drive Storage Technology back into the red in the third and fourth quarters. He also cited shortages and high prices of memory chips and intense Japanese competition as negative factors for the rest of the year.

Seagate Technology, Inc. Disappointing sales growth for the second consecutive quarter cut deeply into yearly profit figures for the Scotts Valley, Calif.-based magnetic disk drive maker. Revenue for the year logged in at \$1.27 billion, a 32% increase over the \$958,000 reported for the previous fiscal year, but net income for the year was \$77.3 million, or \$1.54 a share, a 45% decrease from \$139.8 million, or \$2.81 per share, reported in the last fiscal year.

The company admitted that weaker seasonal demand, overstocked warehouses and the possible continued shortage of DRAMs and controllers may make the next fiscal quarter even worse than the one just ended.

Senior Editor Clinton Wilder contributed to this report.



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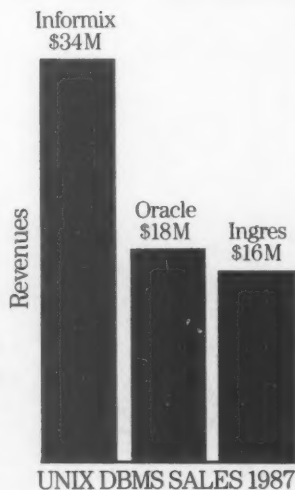
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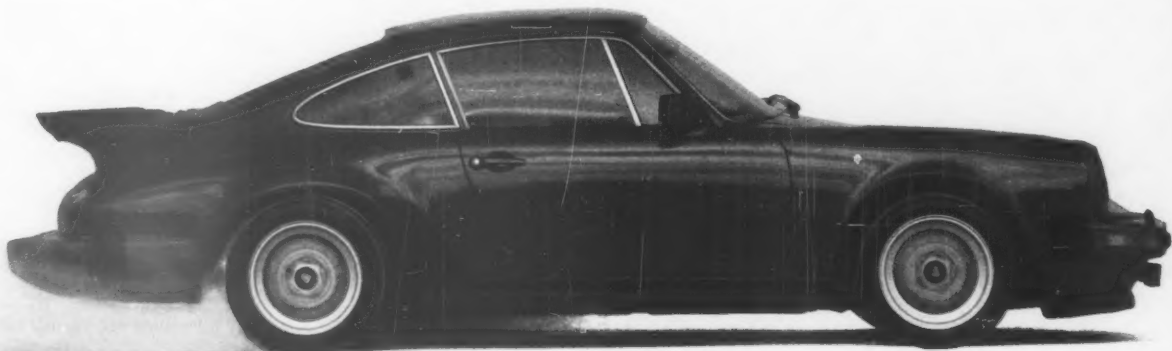
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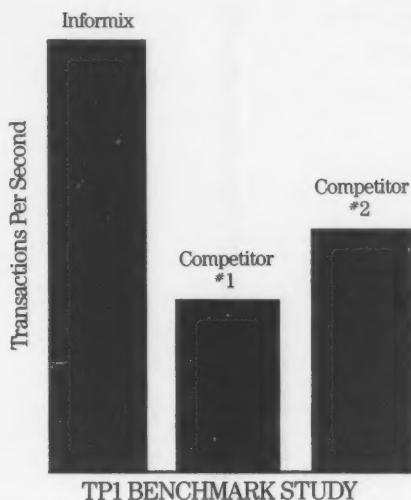


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COMPUTER CAREERS

Advances snag programmers

Employers will seek applications developers with more specialized skills

BY SHERYL KAY
SPECIAL TO CW



There are increasingly dark clouds on the horizon for those batch applications developers who have only programmed in one language and have little or no other expertise. With the commercial popularity of technologies such as data communications, relational data bases, fourth-generation languages and computer-aided software engineering (CASE), these "plain vanilla" programmers cannot be assured of upward career mobility and may indeed vanish in years to come.

Increasingly, employers of applications programmers will seek recruits with real-world experience in one of these advanced technologies; acquiring such expertise is easier said than done.

Experience preferred

The Jack Eckerd Corp., a pharmaceutical retailer based in Largo, Fla., is one company that has occasionally hired general programmers but increasingly is looking for additional technical skills in new employees.

"Generally," says James Ray,

the company's director of MIS, "we prefer to hire programmers who have experience with the software we use because we are able to evaluate how quickly that person will be productive in our environment, as opposed to hoping with someone we will have to train."

In 1987, about 80% of the new programmers hired at Eckerd had IBM IMS data base and communications skills, and 10% had a background in code generators and data modeling tools. Ray anticipates the percentage of hires with IMS skills will stay the same this year but that 50% to 60% of that group will be required to have work experience with CASE technology.

"If the projections for code generators come to pass, the need for basic Cobol programmers may diminish," Ray says. "So those people should really start to expand their skills into more specialized technical areas." He recommends that general programmers who want to ensure their future marketability return to college, take courses, read and volunteer for pilot projects whenever possible.

This advice is also true for those choosing to build a career with their present employer. Key business decisions are often based on information generated through these technologies, and

programmers who remain well versed in them will be better positioned for management.

Often, applications programmers do not have the opportunity to work with new technologies on the job. Should they

who would have to relocate, faced a tough choice.

"I remember her immediate reaction was not good — and understandably so. It was going to be a real sacrifice for her," says Hal Sullivant, president of Linn-Truett, Inc. in San Antonio; he recruited Boazeman for the USAA position.

Boazeman reviewed all of the positives and negatives of staying where she was and accepting

giving up status and responsibility. Eleven years ago, Joyce Krantz worked in a stable job as a senior systems analyst at an insurance company. She had been in the position for one year and previously had developed commercial insurance applications for the same firm for two years using batch Cobol — tape files and ISAM.

A giant step

In seeking a greater challenge, Krantz was offered a programming position at Deere & Co. in Moline, Illinois. "I had a definite momentary qualm," she recalls. "After all, I had been a systems analyst, basically on my own working with users. Now I would be programming again, and reporting to someone at Deere whose job level I was already on."

The attraction was the opportunity to learn data bases. "They were one of the first leaders in IMS development, and they were offering to train me," Krantz says. "I could see how progressive they are. Taking that step down was the best move I could have made."

Many companies do not have the time or the desire to bring programmers on board who lack certain skills and require major training from the start. Accepting a lower level job or salary cut may be well justified if a company is willing to offer training in a leading-edge technology.

Kay is a MIS human resources consultant based in Tampa, Fla.

ACCCEPTING A LOWER level job or salary cut may be well justified if a company is willing to offer training in a leading-edge technology.

aspire to continue their careers in an increasingly competitive market, they may have to sacrifice to gain real-world experience.

Three years ago, Cynthia Boazeman, now manager of management information at United Services Automobile Association (USAA), a reciprocal insurance and financial services organization based in San Antonio, saw the writing on the wall.

Opportunity knocking

As a senior project leader for a Texas-based oil company in 1985, Boazeman was approached by an executive search consultant with an opportunity to join USAA's research and development group at \$10,000 a year less than she was earning. Boazeman, a single parent of two

the position at USAA. "There were no promises made, but she knew if she demonstrated her abilities, her potential at USAA would be tremendous," Sullivant says.

Boazeman has no regrets about her decision to make the move. "I've gotten to play with all kinds of leading-edge technology here, including AI, optical storage and relational data base design," she says. "Now I'm providing our company with information that will help in basing the strategic direction of the company for the next five, 10 and 15 years. It's a far cry from where I might have been, figuring out how much tax to take out of someone's paycheck."

Not all sacrifices for upward mobility come in the form of pay cuts. Sometimes they involve

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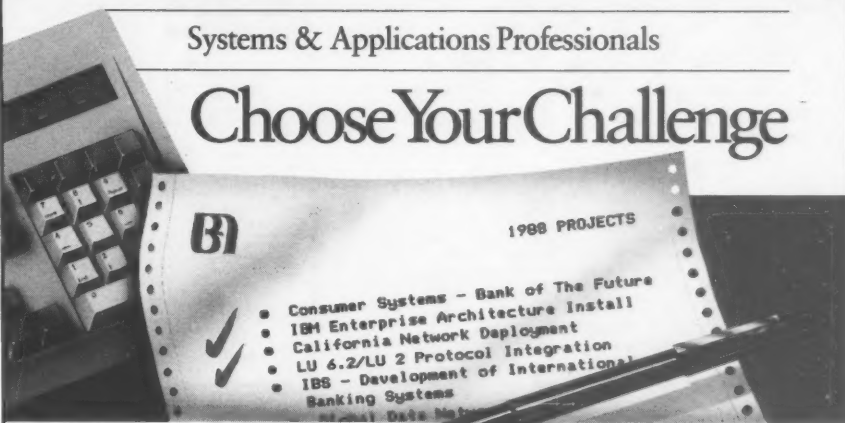
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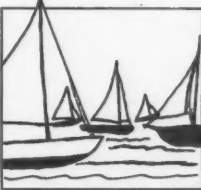
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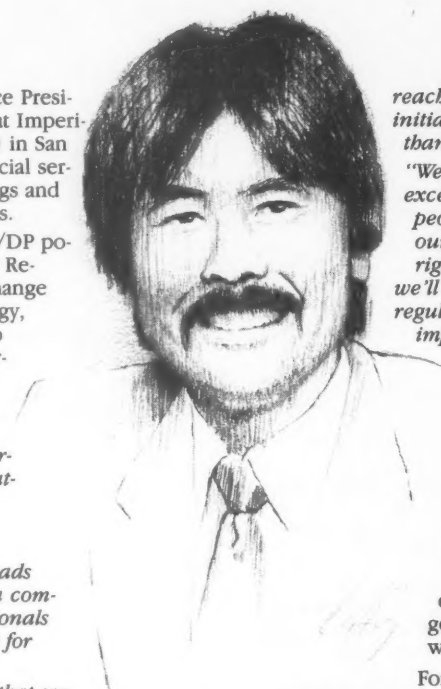
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- TITLE/FUNCTION** (Circle one)
 15. MIS/DP MANAGEMENT
 19. Vice President, Asst. VP
 21. Dir., Mgr., Suprv., IS/MIS/DP Services
 22. Dir., Mgr., Suprv., of Operations, Planning, Adm. Services
 23. Dir., Mgr., Suprv., Analyst, of Systems
 31. Dir., Mgr., Suprv., of Programming
 32. Programmer, Methods Analyst
 35. Dir., Mgr., Suprv., QA/QP
 38. Data Comm. Network/Systems Mgt.
 - OTHER COMPANY MANAGEMENT
 11. President, Owner/Partner, General Mgr.
 12. Vice President/Asst. VP
 13. Treasurer, Controller, Financial Officer
 41. Engineering, Scientific, R&D, Tech. Mgt.
 51. Sales/Mktg. Mgt.
 - OTHER PROFESSIONALS
 60. Consulting Mgt.
 70. Medical, Legal, Accounting Mgt.
 80. Educators, Journalists, Librarians, Students
 90. Others
- COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
 - A. Mainframes/Supernovs
 - B. Minicomputers/Small Business Computers
 - C. Microcomputers/Desktops
 - D. Communications Systems
 - E. Office Automation Systems
 - F. No Computer Involvement

- BUSINESS/INDUSTRY** (Circle one)
 10. Manufacturer (other than computer)
 20. Finance/Insurance/Real Estate
 30. Medicine/Law/Education
 40. Wholesale/Retail/Trade
 50. Business Service (except DP)
 60. Government — State/Federal/Local
 65. Communications Systems/Public Utilities/Transportation
 70. Mining/Construction/Petroleum/Refining/Agric.
 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
 90. Computer/Peripheral Dealer/Distributor/Retailer
 95. User/Other
 99. Vendor/Other
- TITLE/FUNCTION** (Circle one)
 15. MIS/DP MANAGEMENT
 19. Vice President, Asst. VP
 21. Dir., Mgr., Suprv., IS/MIS/DP Services
 22. Dir., Mgr., Suprv., of Operations, Planning, Adm. Services
 23. Dir., Mgr., Suprv., Analyst, of Systems
 31. Dir., Mgr., Suprv., of Programming
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 - E. Office Automation Systems
 - F. No Computer Involvement



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GOVERNMENT OF BERMUDA MINISTRY OF FINANCE DATA PROCESSING UNIT

The Data Processing Unit provides comprehensive computer services to all Departments of the Bermuda Government in the areas of manual and automated systems using both centralized as well as distributed software and hardware.

We are inviting applications from suitably qualified professionals who would like to be considered for the following appointments which are currently available in the Unit:

SYSTEMS DEVELOPMENT OFFICER PS 34 - 36 \$46,395 to \$49,943 per annum

Ref: 885RA/43/28

This appointment is initially available on a fixed term contract until 30th April, 1991.

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- * Develop program, test, implementation and other specifications.
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REF. SCSD1

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At present there is no personal income tax in Bermuda and non-refundable statutory deductions currently amount to 5% of gross salary. A housing subsidy may be paid if rent exceeds 25% of gross salary. However, the cost of living is high and housing rental payments can be expected to amount to 25% of gross salary. Allowances towards the total cost of passage, baggage and settlement will also be provided.

Applications should indicate the post(s) applied for and must contain full details of personal circumstances including number of children, experience, academic and professional qualifications, the names and addresses of four referees (two professional, two character), telephone numbers which will be used in confidence to contact applicants and an indication of when any appointment could be taken up.

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Public Service Commission
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BERMUDA**

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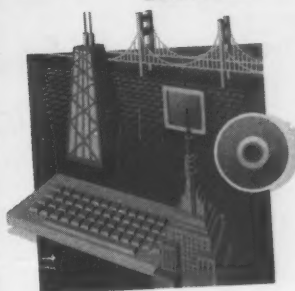
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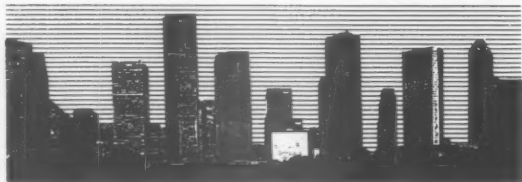
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SYSTEM PROGRAMMER

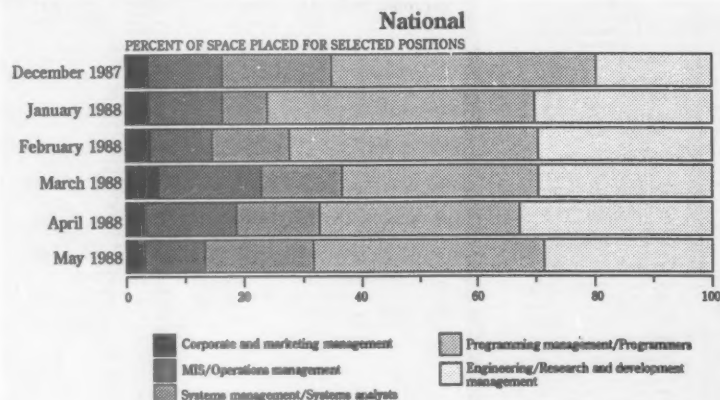
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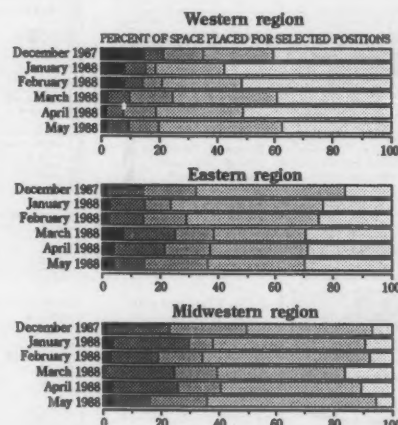
Contact Manager at office listed above. Client Companies Assume All Fees.

CAREER INDEX

Computer recruitment advertising activity*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers



INFORMATION PROVIDED BY CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATA BASE
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MARKETPLACE

Sizing up PC trade-in options

Can corporate users cash in with IBM's allowances for used machines?

BY DAVID A. LUDLUM
CW STAFF

Has IBM got a deal for you?

Some corporate users of IBM Personal Computers have been pondering that question in analyzing the company's recent offer of trade-in allowances on PCs, PC XT's and AT's — as well as PCjr's — for buyers of new IBM Personal System/2's.

First there's the question of whether companies want to trade in old IBM computers at all. When they upgrade, corporations often pass along old computers to new users or sell them to employees. They also may have to deal with unfamiliar accounting maneuvers when trading in computers that have not fully depreciated.

As things stand now, companies that want to trade in old IBM machines for PS/2's must be prepared to move before the program's scheduled expiration date of Aug. 31. However, there is widespread speculation that IBM will extend the program.

"My opinion is that when you offer a trade-in program, you're

not going to be able to take it away. Customers become used to it," says Sean Repko, president of Exsel, Inc. in Rochester, N.Y., a reseller of IBM computers and other office equipment.

Considering the options

Companies that want to buy PS/2's and trade in old IBM PCs by the expiration date may choose from several alternatives, including:

- Selling the old computers to a remarketer.
- Taking a trade-in allowance through another program.
- Listing the computers with a broker of used equipment.
- Selling the computers directly to another user.

IBM's trade-in program is relatively worry-free but is the least lucrative route to take. Authorized dealers, including retailers and value-added resellers, offer trade-in allowances set by IBM that range from \$100 for a PCjr to \$1,175 for a PC AT Model 339 with 512K bytes of memory and a 30M-byte fixed disk.

An IBM spokesman declined to provide allowances for other

models, but sources who obtained the full schedule from IBM say the company is offering \$225 for a PC Model 5150 with 256K bytes of memory and two floppy disk drives.

IBM's allowances for add-ons apply only to IBM goods. Computers traded in must be fully operational, and dealers and their customers arrange the logistics. "In most cases I see the customer physically carrying the machine to the dealer," says Jim Monahan, an IBM spokesman.

In a nutshell, the alternatives to the IBM program involve a trade-off between convenience and financial return.

Resellers like Exsel, which refurbish and resell IBM computers, will buy the machines from corporate users. Exsel has bought PCs in lots numbering from one to 4,000 from corporations including Eastman Kodak Co. and Wang Laboratories, Inc., Repko says.

Currently, Exsel is offering about 50% more than IBM's allowances for the IBM PC 5150 with 256K bytes of memory and dual floppy drives, which is listed

at \$345, and the AT Model 339 with a 30M-byte fixed disk drive, for which it is offering \$1,600.

Since Exsel reconditions the computers it buys, it doesn't necessarily require that they be in working order, although the condition can affect the purchase price. Exsel pays for the transportation of the machines and will move them out of a customer site with or without packaging, according to Repko.

Shop around

Dealers, including authorized IBM dealers, can offer computer buyers trade-in allowances through programs other than IBM's. Nynex Business Centers, a nationwide chain of 84 computer stores, launched its own trade-in program in August 1987. The chain maintains a list of quotations for trade-in allowances on IBM, Apple Computer, Inc. and Compaq Computer Corp. PCs, which it updates every month.

The allowances are somewhat more than Exsel's. Currently, Nynex offers \$350 for the IBM PC Model 5150 with two floppy drives and \$2,099 for the PC AT 339 with a 30M-byte fixed disk.

Nynex requires computers traded in to be in working order. It will help customers prepare

computers for shipment and remove them from the customer's premises. Often the customer's biggest trouble is having lost track of some of his computers, according to Bruce Bixby, the chain's director of market management and support. "Probably the biggest challenge the customers have is knowing what they want to trade in," he says.

A time-consuming but potentially more lucrative means of disposing of PCs is listing them with a broker, such as Boston Computer Exchange Corp. "For a slightly more cumbersome process, you can probably make as much as \$2,000 more," says Alexander Randall, president of the exchange.

Closing prices on the exchange have been at least three times those of IBM's trade-in allowances, according to Randall. Recently, the PC Model 5150 closed at \$750 and the AT Model 339 at \$3,100. The exchange keeps a commission of 10% of the price, and the buyer's money is held in escrow for 48 hours pending confirmation that the computer is in working order. The buyer and seller generally exchange the computers themselves.

Ludlum is a *Computerworld* senior writer.

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The BoCoEx Index

Closing prices report for the week ending July 15, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	\$750	\$950	\$600
XT Model 086	\$1,100	\$1,100	\$875
XT Model 089	\$1,350	\$1,400	\$1,150
AT Model 099	\$2,050	\$2,350	\$1,800
AT Model 239	\$2,500	\$2,650	\$2,125
AT Model 339	\$3,100	\$3,250	\$2,900
PS/2 Model 30	\$1,525	\$1,650	\$1,300
PS/2 Model 50	\$2,275	\$2,375	\$1,900
Compaq Portable I	\$750	\$800	\$575
Portable II	\$2,200	\$2,375	\$1,650
Portable III	\$3,000	\$3,100	\$2,700
Portable 286	\$2,250	\$2,350	\$1,675
Plus	\$1,100	\$1,100	\$900
Deskpro 20-MHz	\$1,250	\$1,450	\$975
Deskpro 286	\$2,375	\$2,475	\$1,800
Deskpro 386	\$5,100	\$5,100	\$4,600
Apple Macintosh 512	\$725	\$825	\$595
512E	\$825	\$925	\$650
Plus	\$1,125	\$1,125	\$850
Plus 20-MHz	\$1,350	\$1,350	\$1,350
SE	\$2,200	\$2,300	\$1,925
SE 20-MHz	\$2,600	\$2,600	\$2,500
II	\$4,750	\$4,750	\$4,500
NEC Multispeed EL	\$900	\$950	\$650
Toshiba T3100/10	\$1,600	\$1,625	\$1,550

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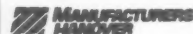
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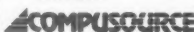
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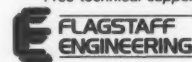
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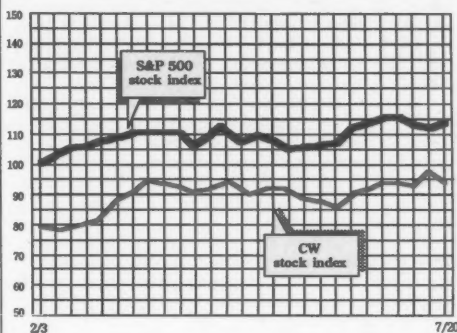
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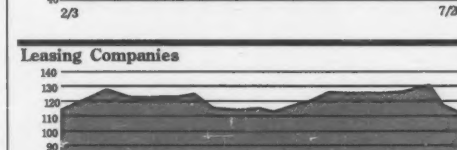
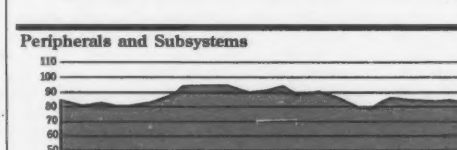
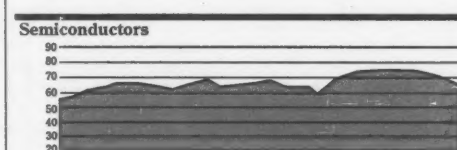
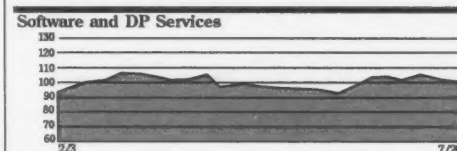
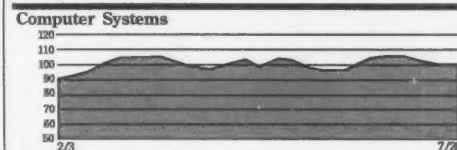
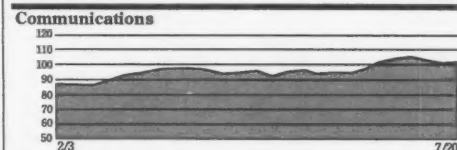
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STOCK TRADING INDEX



Indexes	Last Week	This Week
Communications	101.5	102.1
Computer Systems	101.7	101.1
Software & DP Services	102.8	101.1
Semiconductors	71.3	68.6
Peripherals & Subsystems	85.6	83.5
Leasing Companies	118.5	112.4
Composite Index	91.9	89.9
S&P 500 Index	112.7	113.6



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 20, 1988

			PRICE		
			52-WEEK	CLOSE	WEEK
			RANGE	JULY 20	NET
			(1)	1988	CHNGE

Communications and Network Services

N	AMERICAN INFO TECHS CORP	100	74	90.13	0.5	0.6
N	ANDREW CORP	19	11	19.00	1.5	8.6
Q	ARTEL COMM CORP	3	3	2.36	0.0	0.0
N	AT&T	36	20	26.88	0.8	2.9
Q	AVANT GARDE COMP INC	6	2	2.38	0.6	35.7
Q	AWATEK INC	16	7	17.38	-0.5	-7.5
N	AYDIN CORP	35	16	20.00	0.1	0.6
N	BELL ATLANTIC CORP	80	81	69.88	0.1	0.2
N	BELLSOUTH CORP	44	25	41.25	-0.4	-15.9
N	COMPRESSION LABS INC	6	2	4.00	0.0	0.0
Q	COMPUTER NETWORK TECH	5	1	1.27	0.0	-1.2
Q	CONTEL CORP	40	25	35.88	2.1	6.3
Q	DATA SWITCH CORP	10	4	8.13	0.3	3.2
Q	DIGITAL COMM ASSOC	46	20	33.75	-0.6	-1.8
Q	DYNATECH CORP	32	14	21.75	-0.1	-0.6
Q	FBRONICS INTERNATIONAL INC	6	2	3.50	-0.1	-3.4
Q	GANDOLF TECHNOLOGIES	8	5	7.13	0.0	0.0
Q	GENERAL DATACOM INDS	10	3	3.38	-0.1	-3.9
Q	ITE CORP	45	29	39.75	0.0	0.0
Q	INFOTRON SYS CORP	14	5	11.50	-0.9	-7.1
N	ITT CORP	66	42	50.50	-1.4	-2.8
N	M&A COMM INC	16	7	10.75	0.1	1.2
Q	MCI COMMUNICATIONS CORP	18	7	17.38	2.0	13.0
Q	MICOM SYS INC	17	7	14.63	-0.1	-0.4
Q	NETWORK EQUIPMENT TECH	28	12	20.00	-0.8	-3.6
N	NETWORK SYS CORP	13	7	10.25	0.3	2.5
Q	NORTHERN TELECOM LTD	24	14	18.88	0.3	1.3
Q	NOVELL INC	30	12	27.00	0.8	2.9
Q	NYNEX CORP	78	58	34.88	-0.8	-2.8
Q	PACIFIC TELEVISION GROUP	34	23	29.25	0.4	1.3
Q	PARADYNE CORP	9	4	4.75	-0.5	-9.5
Q	PERIL CORP	5	1	5.00	-0.1	-1.0
N	PLESSEY PLC	38	23	29.38	0.9	3.1
N	SCIENTIFIC ATLANTA INC	20	8	14.63	-0.4	-2.5
N	SOUTHWESTERN BELL CORP	46	22	37.88	-0.8	-3.9
Q	3COM CORP	26	12	18.25	-1.8	-8.8
Q	UNISYS CORP	14	5	12.31	0.0	0.0
Q	U.S. WEST INC	50	43	54.63	-1.0	-1.8

Computer Systems

Q	ALLIANT COMPUTER SYS	21	5	5.75	0.0	0.0
Q	ALPHA MICROSYSTEMS	7	3	6.25	-0.1	-2.0
Q	ALTOS COMPUTER SYS	15	9	9.50	0.3	2.7
Q	AMDAHL CORP	56	19	5.15	0.1	0.2
Q	APOLLO COMPUTER INC	23	9	10.00	-0.9	-8.0
Q	APPLE COMPUTER INC	60	28	44.25	-0.5	-1.1
Q	BOLT BERANKE & NEWMAN	25	12	2.00	-0.2	-2.2
Q	BRITTON LEE INC	4	1	2.88	0.2	7.0
N	COMPAQ COMPUTER CORP	79	34	61.25	-1.3	-2.0
Q	COMPUTER AUTOMATION INC	16	5	5.00	-0.9	-9.0
Q	COMPUTER CONSOLES INC	9	2	8.63	0.3	3.0
Q	CONTROL DATA CORP DEL	24	11	17.25	0.0	0.0
Q	CONVERGENT TECH	36	10	26.63	-0.8	-3.6
Q	CONVEY COMPUTER CORP	17	6	7.75	-0.5	-6.1
Q	CRAY RESH INC	119	47	81.75	-2.4	-2.8
Q	DAISY SYS CORP	12	5	9.38	-0.5	-5.1
Q	DATA GEN CORP	37	16	22.38	-0.5	-2.2
Q	DATAPoint CORP	9	3	3.35	0.3	5.0
N	DIGITAL EQUIP CORP	200	99	107.63	-0.9	-0.8
N	FLOATING POINT SYS INC	12	3	3.50	0.5	16.7
Q	GOLD INC	34	18	14.88	-0.8	-3.8
N	HARRIS CORP	41	22	27.63	-1.4	-4.7
N	HEWLETT PACKARD CO	74	36	52.63	-0.4	-0.7
N	HONEYWELL INC	91	49	65.38	-3.3	-7.7
N	IBM	176	102	124.00	-1.3	-1.0
Q	INFORMATION INTL INC	16	9	15.25	0.3	1.7
Q	ILS SYS INC	3	1	2.25	0.1	0.9
Q	MASS COMPUTER CORP	14	4	4.38	0.8	20.7
Q	MEGASAT ELEC INTL LTD	228	103	202.25	13.9	7.4
Q	MEGADATA CORP	2	1	2.81	0.0	0.0
Q	MENTOR GRAPHICS CORP	39	14	31.75	-1.5	-4.5
N	NBI INC	13	4	4.25	0.1	3.0
Q	NOR CORP	87	50	58.97	-3.2	-5.1
N	PRIME COMPUTER INC	31	12	14.75	-0.4	-2.5
Q	PYRAMID TECHNOLOGY	16	5	14.00	-0.5	-3.4
Q	STRATUS COMPUTER	25	15	25.75	-1.0	-5.0
Q	SUN MICROSYSTEM INC	44	14	35.75	-1.5	-4.0
Q	SYMBOLICS INC	5	1	1.31	0.1	10.5
Q	SEQUENT COMPUTER SYS INC	20	9	17.75	-0.6	-3.4
N	TANDEM COMPUTERS INC	37	16	17.38	-1.9	-9.7
N	TANDY CORP	57	28	43.88	-1.1	-1.1
N	ULTIMATE CORP	37	12	11.88	-0.8	-5.9
N	UNISYS CORP	48	24	35.00	0.4	1.1
A	WANG LABS INC	19	10	9.88	-0.4	-3.7

Software & DP Services

Q	ADVANCED COMP TECH	6	1	1.19	0.1	5.6
N	AGS COMPUTERS INC	30	11	27.00	-0.1	-0.5
N	AMERICAN MGMT SYS INC	20	9	15.13	-1.8	-10.4
N	ANACOMP INC	19	6	13.38	-0.1	-0.9
N	ANALYSTS INTL CORP	10	4	8.75	0.6	7.7
Q	ASHTON TATE	33	13	23.00	-1.3	-5.2
Q	ASK COMPUTER SYS INC	16	6	13.63	-0.3	-1.8
Q	AUTODESK INC	34	12	27.38	-1.1	-3.9
N	AUTO DATA PROCESSING	55	16	38.25	-1.3	-3.2
Q	BOOLE & BAGGAGE INC	12	5	8.88	0.1	1.4
N	COMPUTER ASSOC INTL INC	37	15	27.00	-1.5	-5.3
Q	COMPUTER HORIZONS CORP	15	7	11.69	0.1	0.5
N	COMPUTER SCIENCES CORP	73	38	44.00	1.6	3.8
N	COMPUTER TASK GROUP INC	16	9	13.38	0.4	2.9
Q	COGNOS INC	2	1	5.63	0.2	3.4
Q	COMSHARE INC	27	12	22.00	2.3	11.4
Q	CULLINET SOFTWARE INC	14	4	7.25	-0.5	-6.5
Q	DUQUESNE SYS INC	10	10	17.25	-0.8	-4.2
A	DATA ARCHITECTS INC	16	7	13.75	0.0	0.0
N	GENERAL MTRS (CLSE)	51	30	40.25	0.8	1.9
N	HOSAN SYS INC	14	3	4.13	0.1	3.1
Q	INFORMIX CORP	31	12	14.75	-8.3	-35.9
Q	INTELLICORP INC	8	2	2.88	-0.3	-8.0
Q	KEANE INC	16	3	12.75	0.3	2.0
Q	LOTUS DEV CORP	40	19	21.75	-1.5	-6.5
Q	MANAGEMENT SCI AMER	14	6	8.00	-1.1	-12.3
Q	MICRO DATA CORP	7	2	2.25	0.2	9.1
Q	MICROSOFT CORP	79	37	64.00	-2.8	-4.1
Q	MORINO ASSOCIATES INC	20	7	18	-0.3	-1.4
Q	NATIONAL DATA CORP	34	20	25.75	0.9	3.5
Q	ON LINE SOFTWARE INTL INC	22	6	6.00	-0.5	-7.7
Q	ORACLE SYS CORP	22	8	19.25	-1.5	-7.2
Q	PANOSMIC SYS INC	28	11	15.63	0.9	-5.3
Q	POLICY MGMT SYS CORP	30	15	23.25	-0.3	-1.1
Q	PROGRAMMING & SYS INC	14	7	12.75	1.3	11.5
Q	REYNOLDS & REYNOLDS CO	38	13	18.25	0.4	4.4
Q	SEI CORP	22	10	18.50	0.0	0.0
Q	SHARED MED SYS CORP	30	19	21.25	0.0	0.0
Q	SAGE SOFTWARE INC	15	5	6.38	0.0	0.0
Q	SOFTWARE PUBLG CORP	25	5	21.88	-1.5	-6.4
A	STERLING SOFTWARE INC	11	6	6.50	-0.1	-1.9
Q	SUNGARD DATA SYS INC	20	10	19.63	1.3	6.8

Q	SYSTEMATICS INC	34	19	32.50	-0.8	-2.3
N	SYS. SOFT INC	24	7	17	-2.3	-11.7
Q	VM SOFTWARE INC	21	7	15.88	1.1	7.6

Semiconductors

N	ADV MICRO DEVICES INC	25	8	14.13	-0.8	-5.0
N	ANALOG DEVICES INC	24	8	14.38	-0.3	-1.7
Q	ANALOGIC CORP	13	5	7.38	-0.3	-3.3
Q	INTEL CORP	42	18	33.75	-2.5	-6.9
Q	LSI LOGIC CORP	15	7	13.25	1.0	8.2
N	MOTOROLA INC	74	35	49.00	-3.3	-6.2
N	NATI SEMICONDUCTOR	22	10	11.13	-0.8	-6.8
N	TEXAS INSTRS INC	80	38	43.00	-2.8	-6.0
A	WESTERN DIGITAL CORP	30	11	14.00	-0.5	-3.4

Peripherals

N	ALLOY COMP.	13	2	2.25	-0.3	-10.0
Q	AMR INTL INC	9	3	5.75	0.6	12.2
Q	AST RESH INC	21	6	15.88	0.4	2.4
Q	AUTO TROL TECH CORP	7	3	5.00	-0.1	-2.4
Q	BANCTEC INC	14	5	8.25	0.3	3.1
Q	CIPHER DATA PRODS INC	12	4	9.75	0.0	0.0
A	COGNITRONICS CORP	5	2	3.00	-0.3	-7.7
N	COMPLUGRAPHIC CORP	28	19	25.88	0.0	0.0
Q	DATAPRODUCTS CORP	24	7	11.50	1.5	15.0
A	DATARAM CORP	8	5	7.63	0.6	8.9
N	EASTMAN KODAK CO	71	39	42.88	-1.0	-2.3
Q	EIC CORP MASS	29	6	5.88	-0.1	-2.1
Q	EMULEX CORP	9	4	7.25	0.1	1.8
Q	EVANS & SUTHERLAND	35	14	17.50	1.3	7.7
Q	KEYTECH CORP	6	3	3.38	-0.1	-3.6
Q	INTERLEAF INC	24	11	12.50	0.1	1.0
Q	KOMEGA CORP	5	1	3.56	-0.6	-14.9
Q	LEE DATA CORP	6	3	3.13	-0.4	-10.7
Q	MASSIOR SYS CORP	6	1	2.19	-0.1	-2.8
Q	MAXTOR CORP	16	6	8.63	-0.8	-8.0
Q	MICROPOLIS CORP	15	13	15.00	-1.1	-7.0
N	MINISCRIBE CORP	17	5	12.25	-0.8	-5.8
N	MINNESOTA MNG & MFG CO	84	45	63.25	-0.6	-1.0
Q	MSI DATA CORP	19	8	14.13	0.1	0.9
A	PERSONAL COMPUTER PRODUCTS INC	7	4	5.13	-0.1	-2.4
Q	PRAM CORP	13	7	10.88	0.8	7.4
Q	PRINTRONIX INC	13	7	10.88	0.8	7.4
Q	QMS INC	27	8	7.75	-0.6	-7.5
N	QUANTUM CORP	19	8	10.38	-0.4	-3.5
Q	RAMTECH CORP	6	1	0.63	-0.2	-23.1
Q	RECOGNITION EQUIP INC	21	6	8.00	0.0	0.0
Q	SEAGATE INC	11	4	6.13	-0.6	-3.5
Q	SCAN TRONIC	17	14	15.50	0.0	0.0
Q	SEAGATE TECHNOLOGY	32	10	12.53	-5.5	-30.3
A	STRATUS TECH CORP	4	1	2.63	0.1	5.0
Q	TANDEM CORP	5	1	2.50	-0.1	-5.0
Q	TEC INC	6	3	3.25	-0.4	-11.9
N	TEKTRONIX INC	4	21	24.38	-0.5	-2.0
Q	TELEVIDEO SYS INC	3	1	1.06	0.0	0.0
N	TELEX CORP	73	30	49.00	0.0	0.0
Q	WYSE TECH	40	11	21.00	-0.5	-2.3
Q	XEROX CORP	85	50	53.50	-1.0	-1.8
Q	XIDEX CORP	15	5			

IBM-Hogan

FROM PAGE 1

why the most recent fiscal year's sales were lower than the previous year's.

• The daunting task of Hogan having to teach IBM personnel the banking software business, a job that required, among other things, firing and rehiring some Hogan salespeople.

• IBM's trouble adjusting to a new class of users, a situation that caused it to change several policies and contributed to its slow start within the banking market.

"To say that we didn't have a slow start would be misleading. We did," said Lorraine Fenton, a vice-president of IBM's Application Systems Division, which handles the Hogan agreement.

So far, Hogan and IBM have provided little evidence to indicate even a moderate success. Hogan and IBM have not released financial results from the deal. But a look at Hogan's revenue during the past two years shows that in fiscal 1988, which



Hogan's Fiedler

ended in March, the company reported revenue of \$46.7 million, down from \$48.3 million the previous year. Revenue from new software licenses — \$15.4 million — was also down from \$19.1 million in fiscal 1987.

Another blow to the company was the cutoff of a top development project, an effort company officials had declared was second in importance only to effecting the IBM alliance itself. Hogan was developing a high-performance version of the Hogan banking suite at London-based Midland Bank PLC last year; in the fall, Midland decided to scale

back and end the project before it was completed.

"Midland was a special-version project, not something that we look for," said Hogan Chairman Gary Fiedler in an interview for this report. Hogan plans to continue some of the development that was going on with Midland and fold the enhancements into the banking product line later, he said.

"The IBM-Hogan agreement was recognized within IBM as a bad deal as soon as it was signed," said Roger Philips, president of Philips Associates, a Scottsdale, Ariz., consultant and former president of Transform Logic, Inc.

"It wouldn't surprise me if this dissolves," said Arthur Gillis, president of Computer-Based Solutions, Inc. in New Orleans.

Still committed

Both companies, however, stressed their commitments to the alliance, which could link them until the year 2006. When signed in 1986, the deal provided IBM exclusive North American marketing rights to the Hogan mainframe-based suite of banking applications, which typically retail from \$500,000 to more than \$1 million. Hogan dramatically demonstrated its commitment to the deal by dismissing its entire domestic sales force — only to have to turn around and call part of it back late last year.

IBM renamed the Hogan product line Integrated Banking Applications (IBA); Hogan retained the right to sell it overseas. The deal called for renewal of the pact every five years.

"What people want to talk about and how they portray the relationship at times is not how we perceive it at all," IBM's Fenton said. "We don't view this as an experiment. We don't view

Users stoic

While the landmark deal between Hogan Systems, Inc. and IBM has been the source of controversy beyond the banking industry, it has had little impact on the Hogan user community itself.

Interviews with Hogan users indicate they do not yet regularly deal with IBM, and they said the good relationship they enjoyed with Hogan continues.

"In the 30 years I've been in this business, I'd say [Hogan's] relationship with their users group is the best I've seen," said John Birky, executive vice-president of Citizens Commercial & Savings Bank in Flint, Mich.

"I'd rate them fairly high," added Howard Watson, vice-president of management systems at Leader Federal Savings & Loan in Memphis. Hogan's banking applications are "a well-designed package that I'd say is above average."

Watson said his company has "felt no impact whatsoever" from the IBM-Hogan agreement. Leader Federal continued to work with Hogan after the pact was signed and then switched its maintenance contract from Hogan to IBM in December 1987. However, "we haven't had to go to them yet," he said.

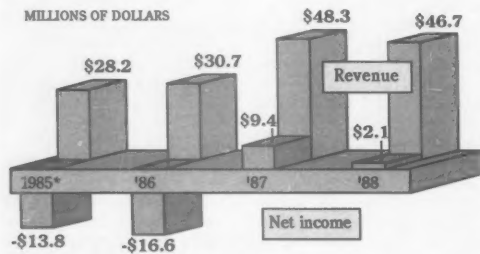
Birky said the IBM-Hogan deal was a "nonevent" that resulted in few changes at his shop and little contact with IBM.

"The time it's taken for them to get going was longer than people thought it would be, but that wasn't a problem for us because we still had the Hogan people," he added.

ROSEMARY HAMILTON

Hogan ups and downs

The IBM alliance has not put Hogan's financial performance on a fast track



* Fiscal year ends in March

CW CHART

The other Hogan

Although a banking software agreement with IBM consumes the bulk of Hogan Systems, Inc.'s resources, the Dallas company is slowly stepping into new territory to broaden its revenue base.

In 1987, Hogan acquired two companies; Systems 4, Inc., which put Hogan in the community banking market, and GDK Systems, Inc., which developed an international money management system for wholesale banking.

Hogan spent close to a year prepping itself for the new markets before taking the plunge. The caution comes from a past of painful lessons, company officials said.

In 1984, Hogan shipped a loans application system to dozens of banks without beta testing it, according to Patric Jerge, an executive vice-president. The product did not function correctly, and soon Hogan had an upset customer base badly in need of service.

"With a tarnished reputation in 1985, we pulled back loans and reworked it," Jerge said. "We're still recovering from the loans fiasco."

The reworking was completed in January 1987, and 15 customers have the application in production use, he said.

This experience was fresh in Hogan minds when the company took on the two new product lines in 1987. The Systems 4 product, renamed Bankvision, had been sold primarily in the Southwest. Before launching it nationally, Hogan spent a year "making sure the products were ready," company spokeswoman Dalene Nichols said.

Bankvision is targeted at small community banks with assets ranging from \$25 million to \$250 million. It runs on the IBM System/36 and was recently ported to the new IBM Application System/400 platform.

"It wasn't withdrawn from the market, but we didn't intensify sales," Nichols said.

Hogan also spent a year fixing the GDK system, the company said. Called the International Money Management System, or IMMS, it is a big-ticket item that typically costs a customer \$2 million.

ROSEMARY HAMILTON

it as a disaster."

IBM and Hogan executives said they expected big things to happen quickly when they came together. They soon learned, however, that they had overestimated IBM's ability to adapt to Hogan's market, which involved a complicated product and a type of customer different from that IBM was accustomed to.

"We thought they'd have 400 people out there hawking the product, and we were naive enough to believe that would work," said Patric Jerge, executive vice-president of Hogan.

Instead, the two have gone through a slow process of teaching the IBMers how to sell banking applications and how to address top bank executives.

"The key [to selling banking software] is to sit with a bank executive and listen and understand his problems," Jerge said. "Banking isn't IBM's business, so they didn't understand it."

IBM salesmen, Jerge added, "were very good at selling to the CIO, but they didn't understand how to sell applications to businessmen."

Approximately 100 IBM marketing and support staffers are dedicated to the product line. They also receive assistance from Hogan and financial specialists within IBM, Fenton said.

IBM also changed a policy of licensing applications on a per-CPU basis to a single license fee, regardless of how many CPUs they would run on. "Banks might be using three CPUs, and so they don't want to pay three times more than what they would have paid Hogan," Jerge said.

Customers contacted recently also said the pair had a slow start.

Dave Shipley, senior vice-

president of the systems operations division at First American Corp. in Nashville, received a sales pitch from the IBM-Hogan team last year.

"It demonstrated that IBM is starting to get into the picture, but my opinion is that the merger is still in the initial stages. I'm not sure everything has worked out," Shipley said.

He said the four-person sales team included three Hogan staffers and an IBM person who "took a back seat."

Shipley has yet to select a vendor and said in regard to the Hogan-IBM offering, "We're in a wait-and-see mode."

Numbers misleading?

The few numbers that have been released by IBM's Application Systems Division put a more positive light on the deal. For example, in an interview published by Hogan this year, IBM's Joseph Guglielmi, president of the Application Systems Division, said IBM signed up 61 licenses last December alone and 19 licenses in January and February of this year.

But while the December number looks good at first glance, it does not necessarily represent 61 sales, according to Richard Schwenk, Hogan's chief financial officer. He said the total includes the sale of new modules to existing customers and some conversions of customers under Hogan maintenance contracts to IBM maintenance contracts.

But Hogan and IBM officials asserted that the slow start will be followed by better times ahead. "It was a learning process," Hogan's Jerge asserted. "We've been pushing this ball uphill and we're right now almost at the crest."

Best foot forward

Debit/Credit ETI benchmark figures released by DEC for relational data base management configurations claim price edge over IBM and Tandem

	Relational system	Data base	Debit/Credit transaction/sec.	Cost per transaction/sec. ¹
DEC	Microvax 3600	RDB	5	\$45,000
	VAX 6220	RDB	11	\$63,000
	VAX 8810	RDB	11	\$101,000
	VAX 8830	RDB	27	\$66,000
IBM	AS/400 B50	Integral	4.3 ²	\$107,000
	AS/400 B60	Integral	6.9 ²	\$100,000
	9370 Model 90	SQL/DS	5	\$142,000
	3090 Model 200E	DB2	38	\$229,000
Tandem	VLX (4 CPUs)	Nonstop SQL	13	\$135,000
	VLX (32 CPUs)	Nonstop SQL	104	\$110,000

¹ Based on five-year cost of hardware, software and maintenance

² Estimates based on IBM comparisons to the 9370

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Benchmark

FROM PAGE 1

have ranged all over the map. While some have applauded the new "openness" with performance data, others expressed general scorn for what they see as vendors' attempts to manipulate facts to put their products in a favorable light. Still others blasted the process as confusing.

"This is all a lot of useless arm-waving, and I hope they will soon stop it," said Frederic Withington, an independent consultant in New York.

However, John Logan, vice-president of Boston-based consulting firm the Aberdeen Group, disagreed. "I would love to say I can find something terribly wrong, but I can't," he said of the manner in which DEC conducted the tests.

With such claims, said Omri Serlin, president of Iton International, Inc. in Los Altos, Calif., "you must read the whole document, especially the fine print."

Oracle's TPS rollout, Serlin said, is a case in point. Oracle published the methodology used to obtain the figures and an audit letter issued by Codd & Date Consulting Group. Serlin said Oracle used benchmark procedures employed by many companies, but he pointed out that the apparently clear numbers soon

become enshrouded in qualifications — for instance:

- Oracle Chief Executive Officer Lawrence Ellison repeatedly used the phrase "industry-standard TP1 benchmark," but the company actually employed three benchmark tests, one of which — the "banking benchmark" — is a "reduced functionality, less demanding subset of the Debit/Credit benchmark," Serlin noted.

- Oracle claimed to beat Tandem on a Debit/Credit benchmark. But the TP1 benchmark the company used is a less demanding version of the Debit/Credit test than the one used by Tandem. Experts agreed the two sets of results are not comparable.

- Ellison referred repeatedly to the fact that Oracle's TPS benchmarks were audited by Codd & Date. However, a close reading of Oracle's report revealed that Codd & Date did not audit Oracle's most highly publicized figure — the 265 transaction/sec. logged on an Amdahl Corp. 5890 Model 600E mainframe under IBM MVS.

Ken Jacobs, Oracle data base product manager, said only three of two dozen Oracle benchmarks went unaudited, and those three were conducted the same way as the rest. He said three did not include an audit for reasons of "logistics and time."

Independent consultant Dale Kutnick in Redding, Conn., found "DEC's methodology suspect," he said. He criticized DEC for extrapolating the Tandem numbers and showing the results of Tandem's VLX processors but not its smaller CLX models, with better price/performance.

DEC marketing executive Peter Kastner responded that Tandem has not released complete figures for the CLXs.

Withington said "DEC's results of three times IBM performance and twice that of Tandem don't make sense." He noted that throughput on the Debit/Credit benchmark is easily affected by small changes in system configuration. Kastner agreed but said the benchmark is the best currently available.

Tandem manager of corporate marketing David Dempsey rebutted DEC's results, saying DEC's comparisons with Tandem did not include the cost of twice the disk spindles needed for data base mirroring.

DEC readily conceded it did not include disk mirroring, saying it was not required.

IBM declined to respond to the results; DEC said it will publish in October the full documentation of the benchmarks. "Any really sensible user will take his own application and test the hardware with it," Withington said.

Oracle claims record

Unveils benchmarks for newest OLTP version

BY NELL MARGOLIS
CW STAFF

NEW YORK — Oracle Corp. roared into the City last week with what it claimed to be record-shattering benchmark figures for its long-awaited on-line transaction processing (OLTP)-strength Oracle Version 6.0 — and analysts chalked up a triumph for the Belmont, Calif.-based data base manufacturer.

More than two years in the making and sporting more than 50% entirely new code, Oracle Version 6.0 with its Transaction Processing Subsystem (TPS) option is targeted at the fast-growing group of OLTP users who also want a full-strength data base for development.

In addition to OLTP capacity, the new Oracle delivers fault tolerance, including automatic recovery in the event of CPU failure, on-line backup and recovery in case of disk failure and on-line reconfigurability.

Such attributes, said Kenneth Burke, an analyst at Alex Brown & Sons, Inc., could loom a lot larger in the user's evaluation of the latest Oracle entry than the benchmark results. "You can drive a car at 100 miles an hour," he analogized, "but it's not very much good if the wheels fall off."

Oracle Version 6.0 with the TPS option is slated for commercial availability on IBM, Digital Equipment Corp. and Sequent Computer Corp. systems in approximately 90 days. By the end of the calendar year, Oracle Chairman Lawrence Ellison said, "all our systems will be TPS systems."

In a good spot

A large installed base, already established portability advantages and marketing strength and the technological advances of Version 6.0 position Oracle well against the mounting competition, said Redding, Conn.-based consultant Dale Kutnick.

Oracle entered last week's high-flying press conference with a new slant. Ellison repeatedly emphasized the company's technological ascendancy rather

than the marketing acumen for which it is better known.

"It makes all the sense in the world when our competitors say that our strength is marketing and theirs is technology," he said sarcastically.

Benchmarks run on several different platforms and audited by Codd & Date Consulting Co. showed Oracle Version 6.0 with TPS running faster than any other data base management system under IBM, DEC and Unix operating systems.

Apples and oranges?

Omri Serlin, president of Los Altos, Calif.-based market research firm Iton International Co., had a few qualms about Oracle's latest ace. Information supplied by Oracle relied on "a lot of apples-and-oranges comparisons" and was likely to confuse users, he commented (see story page 1).

Nevertheless, Serlin said, Oracle's aggressive numbers "are certainly reason for everyone to take a fresh look at what they've done with their technology." He noted the enthusiastic presentations made by four TPS beta-test users, three of whom benchmarked Oracle Version 5 against the new Version 6.0, showing dramatic performance improvements. "One thing that's clear," he said, "is that Oracle has broken out of its old limitations."

With regard to distributed data base capacity — last year's relational data base buzzword of choice — Oracle Version 6.0 has full distributed query and single-site distributed update capability, Ellison said.

Still missing, however, is the two-phase commit capacity widely regarded as indispensable to a system's being fully distributed. Two-phase commit will be featured in Version 6.1, which is due out later this year, according to Ellison.

Oracle's TPS will be priced from \$16,000 to \$75,000, depending on platform; a special introductory discount of 33% will be available through the end of November for customers of record as of Aug. 31, Oracle said.

Oracle stakes its claim

Oracle benchmarks claim high marks in transaction processing

Operating system	CPU	Data base size (millions of records)	Transaction/sec.
IBM MVS	3090 Model 600E	0.1	265
		1	245
Unix	Sequent	0.1	124
		11	110
DEC VAX	6240	0.1	49
		5	43

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CW CHART

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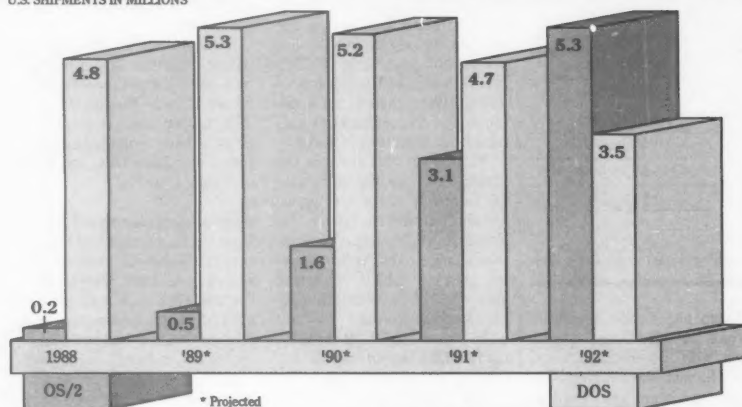
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TRENDS

PC operating systems

New kid on the block challenges neighborhood heavyweight

U.S. SHIPMENTS IN MILLIONS



Microsoft Corp. and IBM's OS/2 will become the dominant operating system on the desk top by 1992, surpassing its predecessor, DOS, according to Cupertino, Calif.-based market research firm Infocorp.

According to Infocorp, DOS will retain its hold on the market until 1990, when OS/2 will begin to gain steam as more applications become available for the recently announced operating system.

Infocorp predicted that 200,000 copies of OS/2 will be shipped this year, while shipments of DOS will be 4.8 million units. By 1991, the gap between OS/2 and DOS will narrow to 3.1 million vs. 4.7 million, respectively.

OS/2 shipments will overtake DOS in 1992, according to Infocorp. Shipments of OS/2 will reach 3.5 million as opposed to 3.1 million for DOS, the firm forecast.

Today, OS/2 accounts for 1.8% of the overall market for desktop operating systems, which totals 8.6 million units.

By 1992, OS/2's presence will become significant, rising to 28.8% of the overall market, which Infocorp estimated will be 18.4 million units.

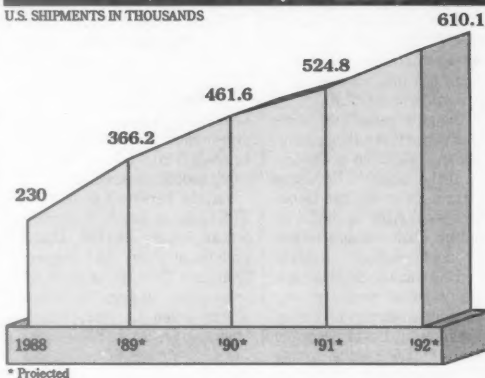
Unix, which its proponents are billing as the alternative to OS/2, stands to gain steady ground, but it will not match the dominance of its rival, according to the market research firm.

Unix shipments will reach 230,000 this year. By 1992, Unix shipments will have risen to slightly more than 610,000, according to Infocorp projections.

STEPHEN JONES

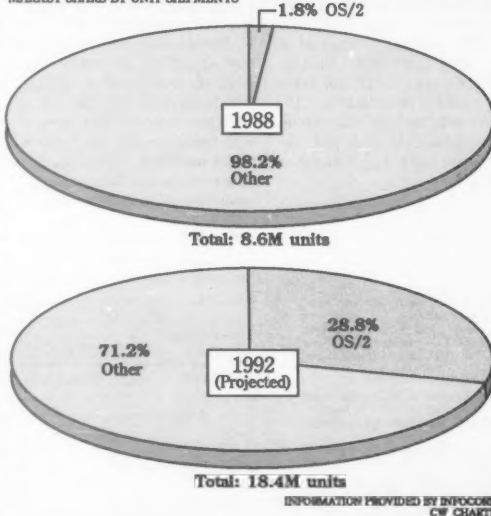
Meanwhile, Unix slowly wins recruits

U.S. SHIPMENTS IN THOUSANDS



OS/2 stakes bigger claim on territory

MARKET SHARE BY UNIT SHIPMENTS

INFORMATION PROVIDED BY INFOCORP
C/W CHARTS

INSIDE LINES

What's a VAX? Software AG's Adabas relational DBMS and Natural fourth-generation and application development language are due to arrive on Wang's DS line of minicomputers early this autumn. Pioneered in Europe and now in beta test, the Wang-based packages will be announced at the Reston, Va.-based vendor's annual user week, which starts Sept. 26.

Gee, Eddie, the Beaver's looking fat these days. During the next couple of months, expect to see more and more consolidation within IBM. The 1,600-job housecleaning in Boca Raton that occurred late last month was just a part of the continuing consolidation, our source said. The upcoming trims will reportedly reach into IBM headquarters as well as supervisory- and management-level posts at other sites across the U.S. The man doing the dirty work is Ed Lucente, the company president who last week received the call again to get out the mirrors and cut 3,000 to 4,000 IBM jobs with nary a layoff (see story page 6). When Lucente accomplished comparable goals in 1986, he earned the nickname "Neutron Eddie" — for removing the employees while leaving the buildings intact.

Deceiving Dbase. Borland is hoping to give Ashton-Tate's Dbase a run for its money when it comes out with a package that translates Dbase code into code for Borland's Paradox. Also fairly well along in the works, our source said, is a compiler for Borland's PAL programming language.

Widening the Netview/PC funnel. TSB, a Toronto-based company, plans to announce an IBM Netview/PC front end that collects information from a group of devices for real-time network management applications, according to TSB director of projects Ray Blanchette. The new box, which IBM will probably resell, might help Netview/PC become less of a bottleneck when it comes to handling real-time monitoring and reconfiguration information.

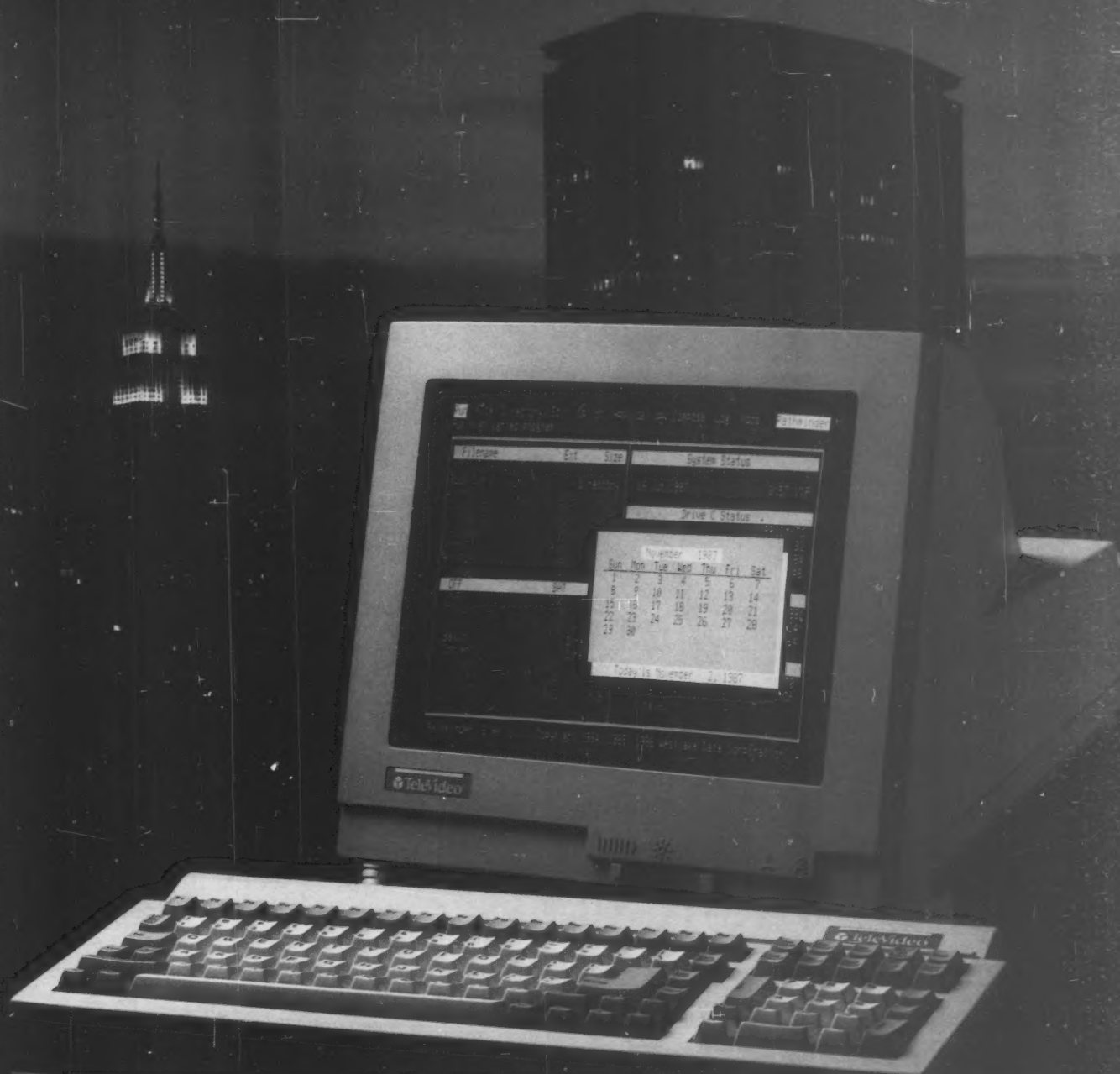
Buying into RISC? The rumor surfaced last week that DEC is planning to buy a stake in Mips Computer said to range from 25% to 50%. Previous rumors had DEC signing a licensing agreement to use Mips' RISC-based microprocessors in its products. Stephen Widen, a DEC follower at International Data Corp., said the move would make sense in that it would put DEC on a solid competitive footing with other RISC-based workstation vendors.

Opening the Blue door. IBM will announce its membership in X/Open today, sources close to the vendor and user consortium said last week. IBM was the last big holdout in the group, which includes DEC, AT&T, Bull, Fujitsu and Unisys. X/Open is an independent group promoting the open systems concept.

(M)ore (V)aried (P)lan. Lotus's Multi-Value Plan (MVP), which provides support, upgrade and sales options for large corporate customers, will be enhanced with a series of announcements set to begin in about a month. Like most sales and support plans, MVP has not exactly taken the world by storm, due to the nearly infinite variety of user needs and the lack of flexibility of most plans.

Get it together. The maker of Xywrite word processing software, Xyquest, is set to show off a new groupware system that borrows key elements from the firm's software, which is popular among newspaper and magazine organizations. Few details were available, but expect a fall ship, the Xywriters said.

The Oracle and DEC on-line transaction processing products are so big, industry wags note, that both companies had to make multiple announcements to get the word out. Oracle announced a couple of weeks ago that it planned to make an announcement, and DEC has foreshadowed its latest offering at hardware rollouts earlier this year. So let's see how good they really are. When some commercial operations put these products through their paces, call the hot line at 800-343-6474 or 508-879-0700 and let News Editor Pete Bartolik in on how reality stacks up to the marketing.



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